WTCI-11-P

PROPERTY CONDITION ASSESSMENT
OF
WORLD TRADE CENTER PORTFOLIO

SUBGRADE

Located In

NEW YORK, NEW YORK

Prepared For

THE PORT AUTHORITY OF NY & NJ
WORLD TRADE CENTER COMPLEX
NEW YORK, NEW YORK 10048

Prepared By

MERRITT & HARRIS, INC.
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FINAL DRAFT

Property #7
Merritt & Harris, Inc. Project Number 20-251E

CD File SK011318

20-251E

December 6, 2000

Mr. Jeffrey S. Green
General Counsel
The Port Authority of NY & NJ
1 World Trade Center
New York, New York 10048

Re: Due Diligence Physical Condition Survey
World Trade Center
New York, New York

Dear Mr. Green:

Enclosed are 7 copies of our report of the conditions observed during our site visits to the referenced property between September 13 and October 31, 2000. For this report, I served as the Project Coordinator, with Peter J. Brady, P.E., as Project Manager and Structural Engineer, and Jack M. Kagan and Joseph Marciano, P.E., as Mechanical/Electrical Engineers.

As previously agreed, Merritt & Harris, Inc. has divided the report into 7 segments as follows:

1. One World Trade Center (Tower A)
2. Two World Trade Center (Tower B)
3. Retail Mall and Plaza
4. Four World Trade Center (Southeast Plaza Building)
5. Five World Trade Center (Northeast Plaza Building)
6. Central Services
7. Subgrade

For convenience, identical copies of Sections I - IV (I - Identification, II - Objective, III - Procedures and Limitations, and IV - Executive Summary) have been included with each report so they can stand independently, if required to do so.

Thank you for selecting Merritt & Harris, Inc. as your consultant on this project. If you have any questions, please call me.

Very truly yours,

MERRITT & HARRIS, INC.

Robert G. Weiland, R.A.
Vice President & Principal

RGW:rw
Enclosure

cc: Thomas C. Richard
Peter Brady
Jack Kagan
Joseph Marciano

REPORT OF
DUE DILIGENCE PHYSICAL CONDITION SURVEY
WORLD TRADE CENTER

Located At

WORLD TRADE CENTER COMPLEX
NEW YORK, NEW YORK

Prepared For

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
1 WORLD TRADE CENTER
NEW YORK, NEW YORK 10048

Prepared By

MERRITT & HARRIS, INC.
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7. Subgrade

SECTION I - IDENTIFICATION

Project Name: World Trade Center

Location: One - Five World Trade Center
New York, New York 10048

Report Prepared For: Mr. Jeffrey S. Green, General Counsel
The Port Authority of NY & NJ
1 World Trade Center
New York, New York 10048

Site Visits and Report By:

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Merritt & Harris, Inc.

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Project Coordinator
Merritt & Harris, Inc.

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William G. Young, P.E.
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Port Authority Personnel Present During Visits:

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Dates of Site Visits: September 13 - October 31, 2000

SECTION II - OBJECTIVE

The purpose of the on-site evaluation and document review is to assess the general physical condition of the property as it currently exists. This report provides a narrative and photographic description of the buildings, as well as a listing of any deficiencies that were noted during our site visit.

The report has been divided as follows into seven component sections for ease of handling:

1. One World Trade Center (Tower A)
2. Two World Trade Center (Tower B)
3. Retail Mall and Plaza
4. Four World Trade Center (Southeast Plaza Building)
5. Five World Trade Center (Northeast Plaza Building)
6. Central Services
7. Subgrade

Each of the volumes contains descriptions of the component, recommendations for items requiring action, and photographs and supporting documentation specific to each component of the project. An overall Executive Summary, identical for all volumes, has been reproduced and included in each of the volumes for convenience. Shared site feature and service elements are described and discussed within the Executive Summary section. Due to the nature of the project, some of the construction elements may be shared or physically interconnected among 2 or more of the project components. As a result there may be some redundancy noted in the report in order to indicate the support of 2 or more project components by these systems.

The Recommendations section for each volume is a listing of items that will require action within the next 10-year period. **Immediate (0-1 Year)** issues are deficiencies which are in violation of codes, which pose a danger to public safety, or which, if left uncorrected, will lead to further deterioration of the property or significantly impact marketability or habitability. Issues that will require addressing during the second to the tenth years are divided into 2 categories, **Future (1-5 Years)** and **Future (6-10 Years)**. These categories represent work not required by agencies or codes, but which, in our opinion, are issues that should be attended to in the context of the prudent management of the property.

ADA compliance work is considered to be mandatory and is listed separately.

SECTION III - PROCEDURES AND LIMITATIONS

To adequately determine the present conditions at the World Trade Center (WTC), Merritt & Harris, Inc. performed on-site observations between September 13 and October 31, 2000. Mr. Leandro Zucchi, Assistant General Manager, Building Services Management of the Port Authority, acted as the Project Coordinator, arranging security clearances, providing knowledgeable escorts for the various components of the project, and facilitating review of available documentation. Over a period of several weeks, our field personnel physically observed the buildings, reviewed documentation, and interviewed Port Authority personnel regarding building conditions, operations and maintenance procedures, and capital projects.

Because of the physical complexity of so large a project, the separation of individual systems into definable areas for inclusion in the reports of the various buildings was not easily achieved. While we have attempted, with the assistance of Port Authority personnel, to assign systems to their associated buildings, the assignments are based on our opinion, with input from the Port Authority, of where the systems logically fall. As the division of buildings and systems into individual entities was never planned or previously assigned, any attempt to separate the buildings and systems for individual transactions should be carefully studied and documented. As we understand from the Port Authority that the WTC transaction will be accomplished by treating the complex as a single entity, the division of buildings and systems in this report has been done to clarify the reporting and simplify the task of reading so large a document.

Merritt & Harris, Inc. selectively reviewed documentation available in the WTC Data Center, located on the 3rd floor of 5 WTC. Merritt & Harris, Inc. focused on those items relating to the physical buildings, and did not review such items as financial reports and leasing documentation. The primary documentation used by Merritt & Harris, Inc. was from the following categories in the Checklist Items:

A. General Property Information
D. Environmental Information (Note that this information was not in the Data Room, but was provided to Mr. Crandlemere in the Port Authority office of Mr. Phil Taylor)
E. Operating and Maintenance Manuals
I. Structural Integrity Inspection Reports
J. Facades
K. Mechanical Reports/Information
L. Vertical Transportation Profile & Inspection Reports
M. Electrical Reports
N. Blast Related Reports/Information
O. Life Safety Code Analysis

Attachment 3 is the Due Diligence Checklist, or listing of available documents as of October 31, 2000.

In addition, a set of original construction documents was available on CD ROM format. A selective review of these drawings was done to familiarize our staff with the basic building layouts, material selections, and design criteria. Due to the volume of documentation available, an exhaustive plan, specification and code review of this property was not performed. Merritt & Harris, Inc. accessed these documents in an attempt to clarify issues raised by observations in the field or to further research references to building components mentioned in the reports by other consultants available in the Data Room.

Our observations were limited to those portions of the project that were visible during the walk-through. In many areas, building finishes concealed structural components from view. Merritt & Harris, Inc. neither took material samples nor performed tests on the building materials or systems. Our investigation of the building facades was performed from ground level and from the roofs.

Some equipment observed was not operating during our visit due to seasonal requirements. No attempt was made to operate the equipment as the facility was occupied and appropriate climate control was required. In the case of idle machinery or equipment, our opinions were formed by interviewing available personnel and reviewing any maintenance records presented to us. In order to be as fully apprised as possible of the operating condition of the major pieces of machinery, a Mechanical Contractor should be retained to start the equipment and witness its operation over a period of time.

While the Port Authority does have a basic emergency plan for dealing with flooding on the property, there is no existing control method to prevent catastrophic flooding of the subgrade levels up to level B-2 due to the total flooding of the PATH tubes. Pockets for control doors were built into the perimeter slurry wall, but doors were never installed, as this method of protecting the building would pose a life-safety threat to trains and passengers in the PATH tubes. The complexity of this problem and the specific expertise needed to address the issues is beyond the scope of competence of Merritt & Harris, Inc. and has not been addressed in this report.

It is not the intent of Merritt & Harris, Inc. to assume any part of the design responsibility, but rather to report our findings to our Client to whom this report is addressed. It is further understood that as building maintenance is ongoing, some areas of concern noted in this report may have been addressed subsequent to our site visit and may no longer be applicable.

The square footage areas used in the following sections are as provided in the J.P. Morgan Offering Memorandum, dated June 21, 2000 (the Offering Memorandum), and in the J.P. Morgan Property Book, dated June 21, 2000 (the Property Book). Independent field measurement of buildings and/or tenant spaces or plan takeoffs is outside the scope of this assignment.

On behalf of the Client, Merritt & Harris, Inc. engaged an independent consultant to conduct a **Phase I Environmental Site Assessment and Asbestos Audit** at the site in conjunction with the due diligence. The survey was conducted by members of the staff of R.W. Crandlemere and Associates, Inc. (Crandlemere) of Weymouth, Massachusetts. The survey included visual observations of the site and buildings, and the accumulation and review of available documentation pertaining to asbestos, hazardous waste, and electromagnetic radiation generated by the roof-mounted communications transmission equipment. Crandlemere took no samples and made no physical tests. The results of the survey and any associated recommendations are contained as attachments to this report. Merritt & Harris, Inc. assumes no liability regarding asbestos audits, hazardous or toxic material monitoring, surveying, or reporting and cannot be responsible for the

work or opinions of other independent consultants engaged to do so. Merritt & Harris, Inc. reviewed the subconsultant's report and extracted summary information for inclusion within our narratives for the convenience of the reader. The environmental subconsultant's reports are provided as attachments to the individual building reports and in their entirety in **Attachment 6** (separate binder) of this portion of the report.

On behalf of the Client, Merritt & Harris, Inc. engaged an independent consultant to conduct an **Elevator Review** at the site in conjunction with the due diligence. The survey was conducted by members of the staff of The BOCA Group International (BOCA) of New York, New York. The survey initially included visual observations of a pre-selected random sampling of 21 elevator and escalator devices at the buildings, and the review of available documentation pertaining to elevator maintenance and modernization programs. The sample elevators selected for observation were chosen to provide a representative specimen from each building and zone and included modernized, partially modernized, and original elevators. Following the initial sampling, BOCA further reviewed and observed additional devices based on callback data provided by the Vertical Transportation Department and on reports prepared by the Port Authority's independent elevator consultant. The reader should note that a bank of elevators (18-23B) was involved in a recent run-by incident. These elevators were not observed and have been excluded from our review to avoid interference with an ongoing legal investigation. The tenant-owned and operated elevators and escalators were not observed and do not form part of this report. Merritt & Harris, Inc. reviewed the subconsultant's report and extracted summary information for inclusion within our narratives for the convenience of the reader. The subconsultant's reports are provided in their entirety as attachments to the individual building reports.

On behalf of the Client, Merritt & Harris, Inc. engaged an independent consultant to conduct a **Curtainwall Investigation** at the site in conjunction with the due diligence. The survey was conducted by members of the staff of Heitmann & Associates, Inc. (Heitmann) of New York, New York. The survey included visual observations of the facades from interior spaces, grade level, and roofs of the buildings, and reviews of available documentation pertaining to the exterior wall maintenance and inspection programs. Heitmann personnel did not ride or descend on any scaffolding or rigging to observe the exterior walls. Merritt & Harris, Inc. reviewed the subconsultant's report and extracted summary information for inclusion within our

narratives for the convenience of the reader. The subconsultant's reports are provided in their entirety as attachments to the individual building reports.

The Merritt & Harris, Inc. assignment included a general review of the building's compliance with Title III of the Americans with Disabilities Act (ADA). Items of nonconformance are cited without regard for whether or not they are, by ADA definition, readily achievable. Factors to be considered in determining whether or not an action is readily achievable include the nature and the cost of the action needed, the overall financial resources of the operation, and the number of persons employed at the site. The decision as to which actions are to be undertaken rests, therefore, with the building ownership in consultation with its accountants, lawyers, and architects. Our general observation of the property's ADA status and related comments is not intended, and should not be construed, to replace a full ADA audit and report.

As stated in the Offering Memorandum, "The Port Authority is a municipal corporate instrumentality and political subdivision of the States of New York and New Jersey which provides transportation, terminal, and other facilities of commerce within the Port District. As such, in connection with the Transaction, the PA will continue to maintain exclusive jurisdiction with respect to certain administrative and governmental matters involving the Complex, including compliance with building, environmental, fire and health codes." The New York City Department of Buildings has indicated to our personnel that they do not maintain any records of violations for this property. A request for a Property Profile Overview for this block and lot number yields no records. The Fire Department provides normal fire fighting and a life safety service to the facility. A Memorandum of Understanding exists between the Port Authority and the Fire Department in which the Fire Department performs regular inspections and directly notifies the Port Authority Fire and Life Safety group of deficiencies to be corrected. Under a protocol with the New York City Fire Department, Port Authority Police personnel investigate certain fire alarms at the World Trade Center rather than transmitting such alarms to the New York City Fire Department.

The Merritt & Harris, Inc. report is intended for the use of the General Counsel of the Port Authority.

SECTION IV - EXECUTIVE SUMMARY

Project Scope

Property Components

The subject property consists of a 6-building complex (4 office buildings, a separate government office building, and a hotel) constructed on top of a 2-level retail mall and a 6-level Subgrade development. The Subgrade contains an underground parking garage, loading docks, storage facilities, and central mechanical and electrical services for the overall property. The Hotel, the New York Marriott World Trade Center (3 WTC), and the governmental office building, the Customs House (6 WTC), are not included in the transaction and, therefore, are not included in the scope of the Merritt & Harris, Inc. assignment or this report. The complex is located in the Financial District of downtown Manhattan, New York City and was completed in phases between 1970 and 1977. The following area summary information is taken from the Offering Memorandum and Property Book.

Building	Year Built	Gross Sq. Ft.	Remeasured Sq. Ft.	Rent Roll Sq. Ft.
One	1970	4,761,416	4,468,634	4,358,604
Two	1972	4,761,416	4,470,598	4,173,612
Four	1977	462,738	505,670	470,978
Five	1975	581,238	632,782	612,958
Subtotal Offices		**10,566,808**	**10,077,684**	**9,616,152**
Retail	1970	614,901	440,327	427,448
Total		**11,181,709**	**10,518,011**	**10,043,600**

Common Site Features

The following site features are common to all of the 7 Property Components:

Legal Description

Block 58, Lot 1

Zoning District

C6-4, C5-3

Easements and/or Encroachments

A property survey is reportedly being prepared, but was not yet completed at the time of this assignment. Our investigation of other documentation and interview of various Port Authority personnel during this assignment have yielded certain information about possible easements or encroachments.

The site is shared by 6 buildings and the retail mall. The Marriott Hotel (WTC 3) and the Customs House (WTC 6) are outside the scope of this transaction; however, there are known interconnections of services and access to shared facilities.

Conventional utility company easements are assumed. In addition there are public rights-of-way for the New York City Transit Authority subways and the PATH rail system throughout the complex.

Interconnecting bridges to three adjacent properties (130 Liberty Street, 2 World Financial Center, and 7 WTC) are reportedly the responsibility of the adjacent owners. There are, however, certain physical connections such as foundations, and service connections such as electrical power services that may be subject to easement or covenant agreements.

The WTC complex also includes a remote river water pumping station, west of West Street in Battery Park City. This station is located under the Plaza near the marina at the Hudson River and Liberty Place. The interconnecting river water loop piping runs underground from the pump station, east along Liberty Place, then north along the west side of West Street, and then eastward across West Street entering the complex at 1 WTC. There is also a river water return out-fall which occurs underground behind the sea wall near the adjacent 2 World Financial Center.

Size/Layout

The site is trapezoidal in shape and contains 15.65 acres. The site is bordered by Vesey Street on the north, Church Street on the east, Liberty Street on the south, and West Street on the west. The Marriott Hotel and the Customs House are excluded from the disposition; however, the land leased for those properties is included in the total site area noted.

Topography

The site slopes gradually downward from the east, where the street grade is roughly equal to Plaza Level, towards the west where the street grade is at Concourse level. The constructed Tobin Plaza, in the central area of the site, is accessed by gently sloped ramps up from Church Street, and by exterior stairways and escalators from the other streets.

Flood Plain

The bulk of the site towards the east side is located in Flood Zone C, an area of minimal flooding outside the 500 year flood plain as indicated on the National Flood Insurance Program Flood Insurance Rate Map, Community Panel Number 360497 0054B effective November 16, 1983. Two areas at the midpoint of the north and south boundaries are within Zone B, areas between the limits of the 100-year flood and 500-year flood, and the western edge of the site is within the 100-year flood zone. While the Port Authority does have a basic emergency plan for dealing with flooding on the property, there is no existing control method to prevent catastrophic flooding of the subgrade levels up to level B-2 due to the total flooding of the PATH tubes. Pockets for control doors were built into the perimeter slurry wall, but doors were never installed, as this method of protecting the building would pose a life-safety threat to trains and passengers in the PATH tubes.

Geological Hazards

The site is located in UBC Seismic Zone 2a, an area of minimal seismicity.

Service Utilities

A complete site survey is in the process of being compiled, but was not available at the time of this report. The information contained in this report is based upon a combination of directly observed utilities and information contained in other reports. In this way, the exact number and size of the utility services has not been included.

Electric - Consolidated Edison (New York Power Authority)
Steam - Consolidated Edison
Gas - Consolidated Edison
Water and Sewer - City of New York
Various telecommunications carriers

Underground Irrigation System	None
Access	Pedestrian access is provided at grade on all four bounding streets of the complex and from the central Tobin Plaza. The project also has direct interior access to NYC subway systems (five interior access points to 3 separate subway lines) and the interstate PATH mass-transit systems. Vehicular access for automobiles is limited to pre-screened tenants on a rental basis, to selected Port Authority employees, and to contractors having an agreement with the Port Authority for parking privileges. There are 4 ramps for access to the automobile parking areas; 1 entrance and 1 exit ramp (Ramps B&C) on the north end of the property on West Street, an exit ramp (Ramp D) on the south end of the property on West Street, and an entrance ramp (Ramp H) on the west end of the property on Liberty Street. These ramps are protected by guard station checkpoints and Delta barriers, which are mechanically operated barriers, which swing up out of the pavement to physically block the ramp. Delivery access is by means of a ramp from Barclay Street, one block north. This ramp passes under an adjacent building, 7 WTC. It is protected by a security checkpoint.
Paving	Surrounding streets are paved with asphalt. Parking ramps are concrete.
Sidewalks	The sidewalks surrounding the complex are generally exposed aggregate concrete, with some areas of granite paving that have been installed to accent building entrances.
Curbing	Curbs at the roadways are steel.
Plaza Deck	The Plaza is a granite surfaced reinforced concrete deck with a bituminous waterproof membrane. Areas of the perimeter of the deck, particularly under the building overhangs of 4, 5, and 6 WTC remain the original concrete with exposed aggregate surface. Expansion joints occur at the perimeter of each of the Tower buildings, and along the east side of the Plaza at the high end of the Church Street entry stairway and ramps.
Deck Drainage	The Plaza generally pitches towards the central area near the fountain where the runoff is collected by a circular trench drain surrounding the recessed fountain area.

Landscaping

Sidewalk wells, with cast iron gratings, framed in red granite pavers are provided for street trees along the Liberty, Church and Vesey Street sidewalks. Raised planters with shrubs and annual flowers separate the central stairway from the 2 ramps at the Church Street entrance to Tobin Plaza. All other plantings are contained in monumental sized concrete planters that also serve as security barriers to prevent unauthorized vehicular access. Other street furniture includes concrete benches and concrete and stainless steel security barriers in sculptural shapes.

Site Lighting

City street lighting on perimeter sidewalks, newly installed site lighting from the roof line of 4 and 5 WTC, and pole-mounted, multiple-lamp fixtures on the Plaza.

Fencing

Some rollaway security gates are provided at the base of exterior stairways to prevent unauthorized after-hours entry.

Amenities/Special Features

The major site amenity is the central Austin Tobin Plaza, a public space enclosed by the 6 buildings that make up the complex. The Plaza focuses on a central fountain and sculpture, representing the sun and its outward flowing rays. The Plaza is the focus of formal and informal activity during the warm weather months, when outdoor music, street vendors, and seating for the Plaza Level restaurant tenants all contribute to the life of the space. A smaller "Memorial Fountain" commemorating those who lost their lives in the terrorist bombing, is located at the west side of the Plaza between 1 WTC and the Hotel building. The Plaza is reportedly closed down in the winter months to prevent potential injury to pedestrians by the possibility of ice falling from the Towers.

The asphalt-paved area to the east of the site has recently had benches and planters installed, adding more outdoor seating for public use. A covered performance stage was installed in this area during the past summer for the Plaza's summer music program. A temporary "Green Market" is also one of the seasonal features used to draw street traffic to the site. Some sections of this area have at times been used for special parking requirements.

Signage

There is a polished stainless steel monolith with a bronze plaque and a red numeral designation at the main entrance door for each of the buildings in the complex. Additional exterior signage is building installed.

Mall entrances are marked with back-painted signs on the glass transoms above the entrance doors. Retail tenants with exterior exposure have window-mounted signage. Major commercial office tenants have signage on some of the entrance door transoms. Awnings with Mall signage have recently been installed at Mall entrances.

Ancillary Structures

The river water pump station is located about one block west of the site at Liberty Place and the Hudson River. It is an underground structure beneath the pavement of Battery Park City Plaza. It is included in the Central Plant Report.

There are some minor kiosk installations for bus shelters, street vendors, and taxi cab dispatchers around the site.

Project Condition

The buildings were originally constructed of good quality materials. The overall present condition of the property is good. However, as with any large complex of this age, ongoing repair and maintenance should be expected to be required.

Site

Site improvements are adequate and appropriate for a project of this size and status. The majority of the Plaza, which serves as the roof for the retail mall, was resurfaced in red and gray granite during the Plaza rehabilitation of 1998-99. The fountain was rehabilitated and made fully operational. New benches and planters were installed. The membrane waterproofing beneath the old pavement was probed and found to be functioning well. In general, the concrete sidewalks around the site perimeter are sound without tripping hazards, but there has been spalling and cracking over the years that is beginning to lead to an unattractive appearance. A 1999 study of the sidewalk conditions was performed by M.E.D.D, a unit within the Port Authority Engineering Department. M.E.D.D. included several recommendations for upgrades; however, there has been no decision to proceed with any of the work at this time. Plaza areas outside of the new granite surface have varying degrees of deterioration. However, the repairs have not been implemented pending the coordination of pavement repairs with the possible extension of retail areas under the building overhangs of 4 and 5 WTC. Pavement replacement is in progress along the West Street side of the site adjacent to the Customs House as a separate project under the auspices of the U.S. General Services Administration.

Structural

The building structures appear to be in adequate overall condition. Major structural repairs following the 1993 bomb blast were successfully completed and signed-off by a Permit to Occupy or Use issued by the Port Authority Office of the Chief Engineer on October 10, 1997. The repairs appear to have been properly engineered and executed. Following the bombing incident, stringent security measures were implemented at the vehicular entrances to the Plaza and subgrade facilities.

In the buildings we observed only minor cracking in some slabs, partitions or in stairwells of the buildings. Some minor slab cracks have been noted which should be monitored by the PA's structural consultant. The slabs at the truck dock and delivery area on level B-1 have deteriorated due to ice-melting salts that enter the building on vehicles during the winter. A slab replacement program is ongoing and should be continued until all of the damaged slabs are replaced. The monitoring of the visco-elastic movement dampers in the two Towers is an essential program that has been strongly recommended for continuation by the PA's outside structural consultant. Building movement is monitored by analysis of measurements taken and recorded by devices located in the 108th floor of 1 WTC. Analysis of these records is done by the Port Authority's independent engineer (LERA) and should continue in the future. In addition, physical sampling and analysis of the condition of the visco-elastic dampers is reportedly continuing on a 5-year cycle, with the next sampling to be done in 2001. The slurry wall that surrounds and contains the subgrade levels of the complex has some seepage that is contained by curbing and leaders, and is discharged by sump pumps in the lowest levels.

The slurry wall and the adjacent floor slabs that brace the wall are inspected on an ongoing basis to ensure that unsafe conditions do not develop. Structural Integrity Inspection (SII) Report I-38, dated April 3, 1998, provided in the Data Room, found the conditions to be acceptable. These periodic inspections should continue.

The rating of the structural fireproofing in the Towers and subgrade has been judged to be an adequate 1-hour rating considering the fact that all Tower floors are now sprinklered. An ongoing program of re-fireproofing the structural steel to the full thickness for 2-hour rating is in place. This work is done on a lease rollover basis whenever there is a full floor of space being built out for new occupancy. To date approximately 30 floors have been completed in the two towers. The PA will require this program to continue. The presence of asbestos containing

structural fireproofing is documented and abatement in tenant spaces is being done in conjunction with lease rollovers. Abatement of asbestos containing fireproofing material in elevator shafts is ongoing. Air monitoring and physical inspections are carried out as part of the regular asbestos O&M Plan. Patching of non-asbestos fireproofing is handled through a program of in-house inspection and repair.

Exteriors

Building exteriors are generally functioning adequately. A regular program of inspection is carried on by ABM, the maintenance contractor, and is monitored by a private consultant engaged by the Port Authority. Exterior caulking and repairs are done as required based on the findings of the 2 inspecting agencies. Ongoing repair to the finishes on the 4 and 5 WTC buildings should be expected and, within the 10-year term, it would be advisable to consider a wet-seal and repainting program for those 2 buildings. There have been proposals for refinishing the 2 Tower buildings which, to date have not yet been implemented. This issue will also need to be addressed within the 10-year term. Other exterior conditions, which require ongoing monitoring, and repair as necessary are the exterior marble panels on some of the lower areas of the retail base of the complex and the exterior plaster soffits on the 4 and 5 WTC buildings.

There has been a problem with ice forming on and falling from the Towers during early and late winter months. The problem is most severe when the temperature at the upper Tower levels (which is several degrees colder than at the Plaza Level) falls below freezing. During high humidity days, ice balls can form and dislodge from the wall and roof surfaces. Damage to nearby buildings and injury to pedestrians has occurred. The Port Authority is well aware of this condition and the PA Police Department takes appropriate action to restrict access to sidewalks and the Plaza when the condition occurs. When surrounding streets are involved, the NYC Police are also advised and involved accordingly. There does not appear to be an architectural solution to this problem as it is caused by an unusual atmospheric condition. In addition, there are incidences of noise generated either by the movement of the Tower corner panels or by the movement of underlying back up deck material during high wind conditions when the Tower movement is significant. There are no signs that this movement has caused any damage to the panels or attachments at this time.

Roofs

The roofs of 1 and 2 WTC are the original membrane systems protected by rigid insulation and a 5" thick concrete overlay. These roofs appear to be serving adequately, with only local repairs to the spalled concrete wearing course required over the next 5 years. The roof of 4 WTC is nearing the end of its anticipated service life and replacement should be anticipated. The roof of 5 WTC was replaced in 1991 and may still be under warranty. Requirements for warranty transfer should be investigated. The bituminous membrane under the Plaza deck, which acts as the roof of the retail area, was examined extensively as part of the work done when the Plaza was refinished last year. There are still some chronic leaks at specific locations; such as at the Tower expansion joints and the expansion joint along the Church Street side, but these leaks are corrected as they occur as part of maintenance.

Interiors

Interior conditions are generally good. Full floor office tenants are reportedly responsible for all finishes on their floors. Finishes on the multi-tenant floors will continue to need periodic replacement. Rest room finishes are now about 25 years old and thought should be given to a phased program of modernization on multi-tenant floors. The 20" x 20" ceiling tiles used in some areas are no longer manufactured and the replacement of these ceilings with standard grid ceilings, rather than having custom tiles manufactured, is recommended when replacement or modernization is necessary. Remediation of deficient tenant separation walls and public corridor walls on office floors is being accomplished as new tenant spaces are built-out. While some of these walls do not extend to the underside of the slab, the condition is not deemed to be an immediate problem in this fully sprinklered facility. Vestibule entries for mechanical rooms entered from fire stairs will need to be added in phases.

The Mall spaces are in good condition with various recent build-outs by national retailers. Phased upgrades of Mall common area finishes have also begun, and consideration should be given to continuing the upgrading throughout the rest of the Mall. Monitoring of the Mall ceiling suspension system is done on a regular basis and should continue to be part of the normal maintenance program. Two additional means of egress have been added to the Mall circulation pattern, following a 1992 study by the World Trade and Engineering Departments. Installation of the third additional Mall egress is pending.

Vertical Transportation

The 238 WTC elevators are being maintained under a full-service contract with Ace Elevator. The survey by BOCA Group International, Inc. initially included visual observations of a pre-selected random sampling of 21 elevator and escalator devices at the buildings, and the review of available documentation pertaining to elevator maintenance and modernization programs. The sample elevators selected for observation were chosen to provide a representative specimen from each building and zone and included modernized, partially modernized, and original elevators. Following the initial sampling, BOCA further reviewed and observed additional devices based on callback data provided by the Vertical Transportation Department and on reports prepared by the Port Authority's independent elevator consultant. An evaluation of the maintenance indicates that "maintenance practices range from acceptable to marginally acceptable, with definite room for improvement in the area of housekeeping." In addition the elevator survey reported significant deficiencies that should be addressed under the terms of the full service contract. In general, it was reported that the service contractor is not proactive in addressing problems and that close oversight by the PA Vertical Transportation Department is necessary to maintain acceptable service and maintenance levels.

The modernization of all passenger cabs with new interior finishes, overlay controllers, ADA features, and firemen's recall has recently been completed. The second phase of the modernization program, including switching over from motor generator sets to SCRs, retrofitting door operators, and installing new door-reopening devices, is ongoing (126 completed, 8 in progress) and should be continued to completion (104 not yet modernized). The modernization is resulting in better service and a higher quality ride. When completed, the elevator system can be considered to be equal to those of new Class "A" office buildings. The high-rise shuttle cars in 1 and 2 WTC and the 6 and 7 cars in each Tower are equipped with "elevator followers" which are designed to eliminate rope impact on shaft elements. The venting of elevator shafts in the two towers is through the elevator machine rooms, due to the configuration of elevators over elevators in the central cores. This has been accepted as the only viable solution by the Port Authority as the Code enforcing agent. A test sample of the "Captivate" system, a high resolution monitor carrying news, weather, and internet information within elevator cabs was recently completed. The system is now to be installed throughout the complex.

All escalators have been modernized with start/stop switches, comb plate switches, demarcation lights, caution signs, controlled descent devices, and remote monitoring systems. Carl White devices have thus far been installed on 2 escalator units.

HVAC

The mechanical systems were adequately designed and constructed using brand-name equipment, which provides adequate cooling for the complex. The freeze protection system, recently installed in the 108th floor mechanical equipment room (MER) of 1 WTC, is budgeted to be installed in all the buildings' MERs so that air conditioning will be available throughout the year (especially during normally cooler months when the outdoor temperatures rise higher than normal).

The 2 Towers exhibit a stack effect where there is either high negative or positive pressures that effect the opening and closing of doors and emit loud noise through the elevator shafts. This is particularly noticeable when there are large differences between indoor and outdoor temperatures, especially in the winter and on very humid days. The stack effect will also cause smoke from any subgrade fires to be pulled upward into the building. For this reason, a smoke evacuation system for the PATH station has been designed and budgeted (see Life Safety in this section).

In 1985, Lucius Pitkin Consulting Engineers, an independent consulting firm, was hired to examine the welds on the high-pressure steam pipe risers. The Pitkin Report stated that many welds exhibited flaws, such as insufficient penetration and cracks in circumferential welds. The report recommended that all welds be examined and that any weld lacking 50% or less penetration be removed and repaired. To date this work has not been done, nor have any welds exhibited leaks. Based on the piping system's satisfactory history, we recommend that the program of monitoring the pipe welds be continued and that the leaks be repaired as they occur. We do not find any evidence that warrants any program of system-wide corrective action.

Although in operation, the majority of equipment is past its published service life, and replacement of the equipment should be anticipated. A major capital project to update the air handling systems has effectively increased the service life and reliability of the air handling equipment. Equipment and component replacement is now performed as part of the ABM service contract.

Since its original construction, the central refrigeration plant has been expanded to include an additional 10,000 tons of capacity and improved performance. Full winter operation of the chilled water systems is now possible and redundant river water piping systems allow for improved service and maintenance programs. Both refrigeration plants operate on R-22 refrigerant. The use of Hudson River water for the cooling plant is in compliance with environmental regulations.

Merritt & Harris, Inc. reviewed the findings of a report written by Jaros, Baum, & Bolles (JB&B), Consulting Engineers, New York, New York, dated October 31, 1996. The report was written for the Port Authority and JP Morgan & Co. Inc. It presented an evaluation of the physical condition of the existing Base Building HVAC, electrical, plumbing, and fire protection systems at the WTC. The WTC 1, 2, 4, and 5; the Mall; and the Subgrade were covered in the report. The majority of the JB&B report's findings addressed issues that we consider to fall within the category of normal maintenance. The Port Authority has addressed, or is in the process of addressing and correcting, the issues noted in the JB&B report. Our observations and reviews of documents have confirmed that the issues are being addressed.

Plumbing

The plumbing systems appear to be functioning satisfactorily. Although operational, the majority of plumbing equipment is past its published service life, and replacement of the equipment should be anticipated. Equipment component maintenance and repair is performed as part of the ABM service contract.

Water hammer arrestors, on a 2" water line in a wall on the 55th floor of Tower 1, recently failed flooding the 55th - 44th floors. Samples of the arrestors were sent out for independent evaluation. It was determined that the bellows in the arrestors failed due to repeated expansions and contractions over a 27-year period. Therefore, it is recommended that a program be undertaken to replace all water hammer arrestors in all buildings, before more failures and flooding occur.

Electrical

The electrical systems appear to be functioning satisfactorily, and adequate electrical capacity is provided for all of the buildings. Major upgrades have taken place including feeder and bus duct replacements. The main electric substations are not in compliance with NYC Code and there is no variance in place. The primary issue is the lack of ground fault protection provision before the switchboard. It is understood that the Port Authority approved this configuration, and since the Port Authority is expected to remain the Code interpreter for this installation, new requirements for compliance will not occur in the future. Some of the electrical substations have been modernized as part of a project-wide infrastructure program. In some of the smaller closets, there are clearance issues where new equipment has been installed. These installations are reportedly grandfathered until any new equipment is added and have been accepted by the Port Authority in its role as Code interpretation official. A new standby power plant, located on the roof of 5 WTC and distribution network (beyond that for emergency power), is available for tenant use. It is understood that an operating certification is not required for this installation since it is not intended for use as a co-generation facility.

Life Safety

The life safety systems are appropriate for this type of facility, and have been upgraded during the life of the complex. Currently a new fire alarm system is being installed throughout the facility, and this installation is addressing open issues including return air smoke detection and annunciation, elevator lobby smoke detector activation, public address loudspeakers, and standpipe telephone jacks. The Fire Command stations in each building have been completed and approved. The majority of spaces are sprinklered, except for main lobbies, electrical and mechanical spaces, and some toilet rooms. The sprinklering plan is consistent with the requirements of the New York City Building Code. A survey is required to determine which floors may have inadequate fire hose reach, and to establish a plan to make these floors become code-comforming.

Technically, the stairwells of the Tower buildings should be vented. Because of the height of the stairwells, however the installation of venting fans would not be practical and would, most likely, pull smoke into the stairways from the corridors, a condition that is not favorable. The Port Authority is aware of the lack of venting in the stairwells and, as the code enforcement agency, has accepted that the addition of venting would cause an unsafe emergency exiting situation.

Because of the stack effect, fumes and smoke from fires that may occur in the PATH station can migrate into the Mall area and eventually into the buildings. A plan to install smoke barrier drops at the PATH entrance ceiling and ducted smoke evacuation from the PATH station through the subgrade space have been approved and budgeted. This plan appears to be a sound one. We are informed that this work will begin shortly.

An egress study has been made which recommended that 3 additional means of egress be constructed in the Mall. Two exits were added and a third, exiting from the vicinity of the present Godiva Chocolatier shop, is planned and budgeted.

Energy Conservation

The buildings have a mix of clear single-pane glazing or tinted single-pane glazing. There is no energy management system, although the central plant control system can be used to check trends and manually optimize the equipment operation. It is of note that electrical power is provided by Consolidated Edison, but purchased directly from the New York Power Authority at a relatively low cost.

Maintenance

Electrical, HVAC and general maintenance is performed under the terms of a consolidated performance-based service contract by ABM Engineering, with oversight by the Port Authority World Trade Department's Building Services Management Division. In general, maintenance of the systems appears to be adequate. Housekeeping (cleaning) deficiencies were noted in stairwells, electrical closets, and service areas. Ongoing repairs and replacement of components were observed to be in progress in various areas. It should be noted that the ABM Engineering contract calls for both the maintenance and repair of equipment. If a new contract is entered into with a service company for maintenance only, the replacement of equipment must be accounted for separately.

ADA Accessibility

The office building entrances, travel routes, and elevators are ADA compliant. ADA compliance on most full tenant floors is reportedly the responsibility of the tenants under terms of the leases (Merritt & Harris, Inc. did not review the leases), which would be a common practice. ADA compliance for toilet rooms on multi-tenant floors is a building owner's responsibility. Upgrades to toilet rooms, signage, and door hardware for building common spaces should be made on multiple-tenant floors.

The Mall has ADA-accessible entrances on grade in numerous clearly marked locations. All ADA entrances have power-assist doors. Although the 2 Mall levels are individually accessible, interior interconnection between the Concourse and the Plaza Levels is available only by ramp and elevator in the 5 WTC building, the office building elevators in 4 WTC, and a private tenant elevator in the Border's Store. We recommend that the redevelopment of the vacant retail space in the southeast section (4 WTC area) include consideration for a public elevator in the Mall common area to streamline ADA access between levels. Public rest rooms in the Mall are accessible as defined by the ADA.

Violation Status

As stated in the Offering Memorandum, "The Port Authority is a municipal corporate instrumentality and political subdivision of the States of New York and New Jersey which provides transportation, terminal, and other facilities of commerce within the Port District. As such, in connection with the Transaction, the PA will continue to maintain exclusive jurisdiction with respect to certain administrative and governmental matters involving the Complex, including compliance with building, environmental, fire and health codes." The New York City Department of Buildings has indicated that they do not maintain any records of violations for this property. A request for a Property Profile Overview for this block and lot number yields no records. The Fire Department provides normal fire fighting and a life safety service to the facility. A Memorandum of Understanding exists between the Port Authority and the Fire Department in which the Fire Department performs regular inspections and directly notifies the Port Authority Fire and Life Safety group of deficiencies to be corrected. Under a protocol with the New York City Fire Department, Port Authority Police personnel investigate certain fire alarms at the World Trade Center rather than transmitting such alarms to the New York City Fire Department.

Environmental Site Assessment

During construction, essentially all soil down to 75' was removed, eliminating any potential pollution from previous uses of the site. R.W. Crandlemere & Associates identified other locations of recognized environmental conditions in the search radius, but concludes that none of these sites or the current use of the WTC, are likely to impact the environmental integrity of the subject site.

The use of Hudson River water for the cooling plant is in compliance with regulations. The current NYDEC State Pollutant Discharge Elimination System (SPDES) permit extends to May 1, 2004. Monitoring reports and SPDES inspections performed in 1999 and 2000 state, "no reported permit limit exceedences."

The 1999 Denny & Associates report concerning the broadcasting and transmission devices mounted on the roof of WTC1 were reviewed. Operational guidelines are currently in place to provide protection to trained workers and escorted visitors. Based on the Denny & Associates report, R.W. Crandlemere & Associates recommends further additional investigation concerning radio frequency exposure levels for visitors to the observation deck on 2 WTC.

The R.W. Crandlemere & Associates *Environmental Site Assessment* is included in its entirety in this report.

Asbestos

Asbestos-containing materials (ACM) were used as sprayed-on fireproofing and pipe insulation during the original construction. Vinyl-asbestos tile is present throughout the complex. The Port Authority has identified the areas having ACM, which are primarily tenant spaces, mechanical rooms, subgrade areas, and elevator shafts. A large portion of the ACM has been removed and the abatement process is continuing as tenant leases rollover and the spaces are retrofitted. Some abatement projects are carried in the capital budgets for 2001-2005 and other VAT and spray-on abatement work is treated as an operating cost. An Operations and Maintenance Plan has been produced and specific staff personnel have been trained and certified as ACM handlers to deal with incidental disturbance of the material. Much of the ACM in the pipe insulation in the subgrade areas has been removed. Tenants occupying floors that may still contain asbestos material have been formally notified.

There is a reported litigation in process for cost recovery related to ACM abatement. This litigation was not reviewed as part of this report and questions pertaining to the subject should be addressed to the appropriate legal entity.

R.W. Crandlemere & Associates reports addressing the presence of ACM are provided in each individual building section of this report.

Specific Recommendations

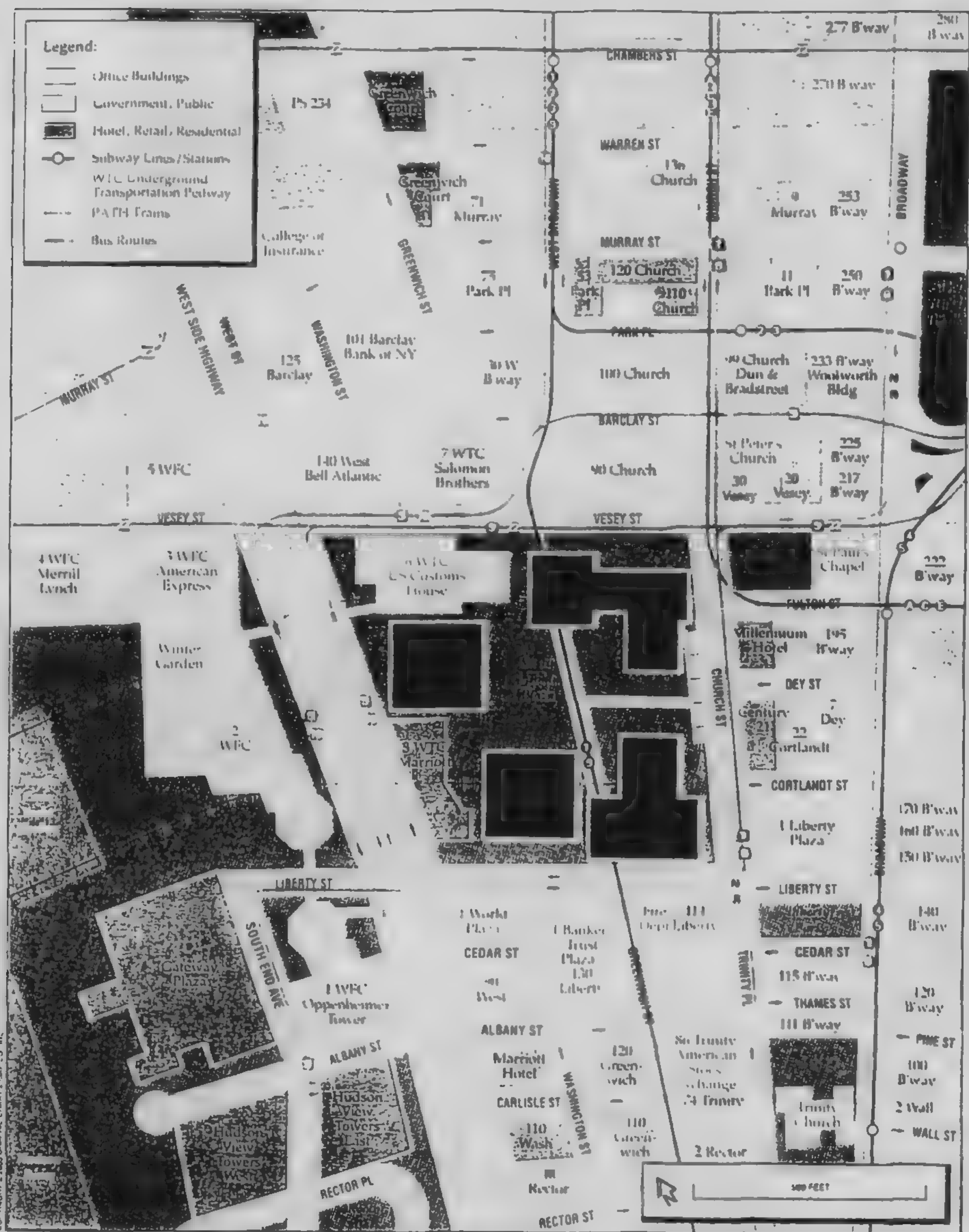
Specific recommendations, items of concern, and building deficiencies are noted in "**E. Recommendations**" section of the individual property component reports. Priorities are divided into **Immediate (0-1 Year)**, **Future (1-5 Years)** and **Future (6-10 Years)** categories.

EXECUTIVE SUMMARY ATTACHMENTS

1. Neighborhood Map (Reproduced with permission from J.P. Morgan Property Book)
2. Résumés of participating Merritt & Harris, Inc. staff personnel
3. Due Diligence Check List of Documents as of October 31, 2000
4. WTC - Proposed 2001 Capital Plan
5. WTC - Proposed 2002-2005 Capital Plan
6. R.W. Crandlemere & Associates Environmental Site Assessment Phase I Report (separate binder)
7. BOCA Group International, Inc. - Overall Observation

ATTACHMENT 1

Neighborhood Map
(Reproduced with permission from J.P. Morgan Property Book)



Legend:
Office Buildings
Government, Public
Hotel, Retail, Residential
Subway Lines/Stations
WTC Underground Transportation Pathway
PATH Trains
Bus Routes
CHAMBERS ST
WARREN ST
MURRAY ST
PARK PL
BARCLAY ST
VESEY ST
FULTON ST
DEY ST
CORTLANDT ST
LIBERTY ST
CEDAR ST
THAMES ST
ALBANY ST
CARLISLE ST
RECTOR ST
RECTOR PL
PINE ST
WALL ST
BROADWAY
CHURCH ST
GREENWICH ST
WASHINGTON ST
WEST SIDE HIGHWAY
WEST ST
SOUTH END AVE
TRINITY PL
277 B'way
280 B'way
270 B'way
PS 234
Greenwich Court
139 Church
College of Insurance
71 Murray
75 Park Pl
9 Murray
253 B'way
120 Church
11 Park Pl
250 B'way
110 Church
101 Barclay Bank of NY
125 Barclay
30 W B'way
100 Church
99 Church Dun & Bradstreet
233 B'way Woolworth Bldg
5 WFC
140 West Bell Atlantic
7 WTC Salomon Brothers
90 Church
St Peter's Church
225 B'way
30 Vesey
20 Vesey
217 B'way
4 WFC Merrill Lynch
3 WFC American Express
6 WTC US Customs House
St Paul's Chapel
222 B'way
Winter Garden
Millennium Hotel
195 B'way
2 WFC
3 WTC Marriott
Century 21
22 Cortlandt
1 Liberty Plaza
170 B'way
160 B'way
150 B'way
1 WFC Oppenheimer Tower
Gateway Plaza
1 Bankers Trust Plaza
130 Liberty
140 B'way
115 B'way
120 B'way
111 B'way
Marriott Hotel
120 Greenwich
86 Trinity American Stock Exchange
74 Trinity
100 B'way
2 Wall
Trinity Church
Hudson View Towers
110 Wash
110 Greenwich
2 Rector
Rector
500 FEET

ATTACHMENT 2

Resumes of participating Merritt & Harris, Inc. staff personnel

THOMAS C. RICHARD, AIA

President & Chief Executive Officer

ACCREDITATION	Registered Architect in the State of New Jersey
PROFESSIONAL AFFILIATIONS	New Jersey Society of Architects Architects League of Northern New Jersey American Institute of Architects (AIA) American Society for Testing and Materials (ASTM) Mortgage Bankers Association - New York Urban Land Institute
EDUCATION	Bachelor of Arts, Fordham University School of Architecture, Pratt Institute
MERRITT & HARRIS, INC. *New York, NY*	Mr. Richard joined the consulting firm in 1981 as a Project Manager and was appointed Vice President in 1984. In 1987 he was named Senior Vice President & Principal heading the Due Diligence Division, which provides total building evaluation services to the real estate financing and investment community. In 1996, Mr. Richard became President & CEO of Merritt & Harris, Inc.
HARSEN & JOHN PARTNERSHIP ARCHITECTS *Tenafly, NJ*	Employed as a Senior Project Supervisor, Mr. Richard worked for the architectural firm from 1969 through 1976. His responsibilities included design and construction supervision of multi-million dollar educational, municipal, and multi-family housing projects. Mr. Richard rejoined the partnership in 1978 as the Director of Operations, with supervisory control of design, document production, construction, and administrative functions of that forty person office, and organized a subsidiary architectural interiors company.
G&R SERVICES *Bogota, NJ*	From 1976 to 1978 Mr. Richard was a partner of a design/build construction company. His duties included administration, construction supervision, design, and estimating. He served as on-site Educational Facilities Design Consultant to the Federal Republic of Nigeria for the design of the National Educational Technology Center in Kaduna, Nigeria.

ROBERT G. WEILAND, R.A.

Principal - Due Diligence

ACCREDITATION	Registered Architect in the State of New York
EDUCATION	Bachelor of Architecture, Pennsylvania State University Graduate Study - Architectural Technology, Columbia University
MERRITT & HARRIS, INC. *New York, NY*	Mr. Weiland joined the consulting firm in 1984 as a Project Manager and evaluated various projects throughout the United States. His responsibilities include review of construction drawings and specifications, and field observation of new and existing construction. Appointed Vice President in 1988, he assumed the responsibilities of coordinating nationwide, multi-site portfolio observations, and developing formats for the presentation of real estate tax appeal projects for municipal government clients. In 1996, Mr. Weiland was appointed a Principal of Merritt & Harris, Inc.
Major Projects	Chrysler Building - New York, NY Macy's Portfolio - Various Nationwide Locations IBM Tower - Atlanta, GA Rockefeller Center - New York, NY Alamoana Shopping Center - Honolulu, HI
IFFLAND, KAVANAGH, WATERBURY, PC *New York, NY*	An Associate of the firm, Mr. Weiland was responsible for industrial, commercial, and television broadcast projects, from initial client contact through program development. His duties also included the production of construction drawings and specifications, and supervision of construction. He was an employee of the firm from 1978 to 1984.
MARINE MIDLAND BANK *New York, NY*	Mr. Weiland worked for the bank as an Architectural Designer in the facilities management department from 1974 to 1978. His job responsibilities entailed client contact for program development and preliminary design, as well as construction document preparation and field supervision for the construction of corporate office facilities and branch banks.
URS/MADIGAN - PRAEGER *New York, NY*	As a Project Architect in 1973, Mr. Weiland prepared construction documents and made field inspections for renovation projects including, municipal garages, stadiums, and waterfront facilities.

JACK M. KAGAN

Principal - Mechanical/Electrical Engineer

ACCREDITATION	Certified, National Board of Boiler and Pressure Vessel Inspectors Certificate of Competency, State of New York Department of Labor, Bureau of Boilers
PROFESSIONAL AFFILIATION	American Society of Mechanical Engineers
EDUCATION	Associates Degree in Applied Science - Mechanical Technology, New York City Community College Bachelor of Mechanical Engineering Degree, Pratt Institute
MERRITT & HARRIS, INC. *New York, NY*	Mr. Kagan joined the consulting firm in 1984 as a Mechanical Maintenance Equipment Specialist. His responsibilities included design review of mechanical, plumbing, electrical plans and specifications, and field evaluation of new and existing construction. In 1988 Mr. Kagan was named Assistant Vice President-Electro/Mechanical Engineer. Mr. Kagan was appointed a Principal of Merritt & Harris, Inc. in 1996.
Major Projects	Ice Palace - Tampa, FL Chrysler / Kent Buildings - New York, NY Las Colinas Office Buildings - Dallas, TX The Waikaloa Resort - Honolulu, HI Greenway Office Towers - Houston, TX
ROYAL INSURANCE CO. *New York, NY*	As a member of the Boiler and Machinery Department from 1981 to 1984, Mr. Kagan was responsible for the technical support of sixty-five field offices and home office departments, for all phases of boiler and machinery equipment insurance.
HEMPSTEAD RESOURCES RECOVERY *Garden City, NY*	Mr. Kagan worked as a process supervisor from 1978 to 1980 and was responsible for the processing of two thousand tons of municipal garbage per day for metals recovery and fuel production for a 40 MW electric generating station.
E.I. DUPONT *Newark, NJ*	Serving as a mechanical supervisor in the Engineering Department, Mr. Kagan was responsible for project engineering, minor construction, and powerhouse and waste treatment operations. He also served as Production Supervisor in the Organic Color Pigments Finishing Department. Mr. Kagan worked at E.I. DuPont from 1974 to 1978.

PETER J. BRADY, P.E.

Project Manager -Due Diligence

ACCREDITATION	Professional Engineer in New York State
EDUCATION	Bachelor of Civil Engineering, City College, City University of NY Master of Civil Engineering, City College, City University of NY
MERRITT & HARRIS, INC. *New York, NY*	Mr. Brady joined the consulting firm in 1994 as a Project Manager for the evaluation of various projects throughout the United States. His responsibilities include the review of construction drawings and specifications, and field observation of new and existing construction.
Major Projects	DisneyWorld Swan & Dolphin Hotels - Orlando, FL Hato Rey Tower - San Juan, Puerto Rico Ritz Carlton - Naples, FL West Port Plaza - St. Louis, MO Wolfchase Galleria - Memphis, TN
DEPARTMENT OF HOUSING PRESERVATION & DEVELOPMENT *New York, NY*	Mr. Brady was hired in 1960 as an Assistant Civil Engineer. His responsibilities included being a field engineer for all phases of hi-rise residential construction. Promoted to Civil Engineer in 1964, his new responsibilities included the review of hi-rise plans and specifications for code compliance, coordination, and completeness. As a Senior Civil Engineer, Mr. Brady supervised engineers on review and coordination of plans and specifications. In 1972 Mr. Brady was promoted to Chief of Engineering and Construction for the New York HPD's Middle Income Housing Program. During the 1980s he directed the HPD's conversion from new construction to substantial and moderate rehabilitation. He developed procedures and forms for recording and evaluating the condition of vacant/vandalized buildings. Mr. Brady also prepared construction standards for compliance with various loan program requirements, and developed parameter cost estimating procedures using personal computers and spreadsheet packages.

JOSEPH J. MARCIANO, P.E.

Mechanical/Electrical Engineer

ACCREDITATION	Licensed Professional Engineer in the State of New York
PROFESSIONAL AFFILIATION	Member, American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. (ASHRAE)
EDUCATION	Bachelor of Science, Cornell University Construction Management Diploma - The Real Estate Institute at NYU
MERRITT & HARRIS, INC. *New York, NY*	Mr. Marciano joined the firm as a Mechanical Engineer in 1996. His job responsibilities include design review services for adequacy and completeness of mechanical and electrical systems for new construction and renovation work. Mr. Marciano's due diligence work includes detailed reviews of the HVAC, plumbing, electrical, life safety, and energy conservation systems of existing buildings.
Major Projects	Warner Theater Building - Washington, DC Blanchard Plaza - Seattle, WA Greenwich Office Park - Greenwich, CT Reston Town Center - Reston, VA West Port Plaza - St. Louis, MO
COMPREHENSIVE DEVELOPMENT CORPORATION *New Rochelle, NY*	As a Construction Consultant from 1991 through 1996, Mr. Marciano provided estimating, scheduling, and claim servicing, as a well as site evaluations, and plan review and coordination. His various responsibilities, included coordinating the mechanical, electrical, and plumbing work at two primary schools for the New York City School Construction Authority. Mr. Marciano also coordinated the contractors in the field, maintained the project records and interfaced with the designers and the client.
NASCO ASSOCIATES *New York, NY*	Mr. Marciano served as a Project Manager and Senior Estimator for this construction management and consulting firm. He specialized in field coordinating and project cost estimating during all stages of design, from conceptual to final, including change order evaluation. Other duties included scheduling, inspecting, handling contractor claims and performing value engineering studies. Mr. Marciano also served as an engineering audit officer on the Stuyvesant High School project in Battery Park City. Mr. Marciano worked for Nasco Associates from 1987 to 1991.

ATTACHMENT 3

Due Diligence Check List of Documents

WORLD TRADE CENTER
DATA CENTER
DUE DILIGENCE CHECKLIST
(As of October 31, 2000)

ITEM		
A	GENERAL PROPERTY INFORMATION	
	1	Offering Memorandum (x2)
	2	Property Book (x2)
B	LEASING INFORMATION	
	1	Argus Rent Roll as of 10/1/00
	2	Port Authority's Rent Roll
	3	WTC Fixed Billing System as of 11/1/00
	4	Leasing Activity Reports
		a. June-Current 2000
	4	Retail Sales Reports
		a. 1998 & 1999
		b Year to Date 2000
		c Total Sales by Store - First Six Months (2000 vs. 1999)
	5	Port Authority ("PA") Comptroller's Suffix Descriptions for WTC Fixed Rent Roll
	6	Copies of Retail, Office and Subgrade Leases and Lease Abstracts
		a. Office Tenants
		b Retail Tenants
		c Subgrade Tenants
		d Telecommunication/Broadcasting Tenants
	7	Leases Under Negotiation and Expected Terms for 2000

ITEM		
8	PA Comptroller's List of WTC Percentage Agreement Tenants	
9	Telecommunication/Broadcasting Agreements	
	a.	Summary of deals
10	Copies of Existing Ground Leases	
	a.	Marriott Hotel
		i Privilege Permit dated as of 1/1/98 to HMH WTC, Inc.
	b	Customs House
11	Remeasurement Study	
C	FINANCIAL INFORMATION	
1	WTC Allocation Methodology Summary of Financial Statements included in the Offering Memorandum	
2	2000 PA Operating Forecast	
3	Historical Operating Statements [1997-1999]	
4	Payroll	
5	Real Estate Taxes	
	a.	Current Assessed Valuation for Block 58, Lot 1
	b	Agreement between the PA and the City of New York, dated as of 1967 regarding Payments in Lieu of Taxes ("PILOT")
	c	1999/00 letter to New York City ("NYC") Explaining PILOT Calculation
6	Agreement between the PA and The Alliance For Downtown New York, Inc., with respect to BID Payments	
	a.	February 9, 1995 Agreement
	b	December 24, 1998 Amendment
7	Capital Expenditures	
	a.	Updated Capital Plan
8	Miscellaneous	

ITEM	
	a. 10/1/00 Rental Receivables Reports
D	ENVIRONMENTAL INFORMATION
1	Summary of Environmental and Asbestos Due Diligence
2	Asbestos Records, including a disclosure memo, identifying known locations of asbestos-containing materials; abatement project files; quantities removed; and estimates of remaining quantities
3	Known Location of Asbestos
4	NYS DEC State Pollutant Discharge Elimination System (SPDES) Discharge Permit, dated 4/12/99
5	Annual Regulatory Permits/Licenses, including Petroleum and Chemical Bulk Storage
	a NYS DEC Petroleum Bulk Storage Registration Certificate, issued 8/4/98
6	Hazardous Materials Response Plans, inventories and certificates
7	Hazardous Waste Manangement records and inspections
8	Annual U.S. Environmental Protection Agency SARA Title III Community-Right-To-Know Inspection Reports-Tier II
9	Annual New York State Department of Environmental Conservation Annual Environmental Audit and Toxic Release Inventory
10	Evaluation of Radio Frequency Environment at the WTC-North Tower (Richard Tell 9/97)
11	RE-Evaluation of Radio Frequency Environment at the WTC-North Tower (Supplemented 9/5/99, revised 3/21/00)
12	Denny & Associates: Electromagnetic field strength survey - South Tower (1/99)
13	Investigation of RF Safety Cosiderations on the WTC Antenna Mast (Richard Tell 5/12/00)
14	Condenser, Hot & Chilled Water Report as of 9/30/00
15	United States of America Federal Communications Commission Antenna Structure Registration, issued 3/23/98

ITEM	
E	OPERATING AND MAINTENANCE MANUALS
1	River Water Pump Station - Vol. 1
2	Remote Lighting Control System - Vol. 2
3	Chiller Plant Addition B6 Refrigeration Plant - Black Binder
4	Mechanical System: Central Refrigeration Plant - Vol. 3
5	Mechanical System: Central Refrigeration Plant (2500 ton chillers) - Vol. 3A
6	Electrical System: Central Refrigeration Plant - Vol. 4
7	Electrical System: Central Refrigeration Plant (2500 ton chillers) - Vol. 4A
8	High Voltage Distribution System - Vol. 5
9	Low Voltage Distribution System, Towers A & B - Vol. 6
10	Emergency Power Distribution System - Vol. 8
11	Plaza Sculpture Fountain System - Vol. 9
12	Low Voltage Distribution System, NEPB & SEPB - Vol. 10
13	Low Voltage Distribution System, Subgrade Levels - Vol. 11
14	Smoke Detection System-Observation Deck, Tower B - Vol. 12
15	Domestic Water System: Tower A & B - Vol. 14
16	HVAC System Tower A & B - Vol. 15
17	Elevator System - Vol. 20
18	Antenna Heating System - Tower A - Vol. 21
19	Fire Protection System - Vol. 23
20	Sewage & Sump System Sublevels Tower A & B - Vol. 25
21	Window Washer & Exterior Platform Equipment Towers A & B - Vol. 31
22	Window Washing & Exterior Wall Maintenance Systems SEPB & NEPB - Vol. 32

ITEM			
	23		Computer Cooling Water System - Towers A & B - Vol. 33
	24		Computer Cooling Water System - NEPB & SEPB - Vol. 34
F	PERFORMANCE INDICATORS		
	1		Fourth Quarter '99, First & Second Quarter '00
G	CAPITAL EXPENDITURE CONTRACTS		
	1		Memorandum summarizing Elevator Modernization Programs
H	SERVICE CONTRACTS		
	1		Contract WTC-799.700: Amendment No.1 to Agreement to Perform Maintenance of Elevators, Dumbwaiters & Escalators: 1,2,4,& 5 WTC (3/18/99)
	2	a	Contract WTC-891.073: Furnish, Install and Configure Office Space Security System Software at the World Trade Center
		b	Contract WTC-799.610: Maintenance of Office Space Security System Software at the WTC (5/94)
	3		Contract WTC 845.071: Modernization of Elevators, Dumbwaiters and Escalators: 1 WTC (3/94)
	4		Contract WTC 838.071: Modernization of Elevators and Escalators- 4 & 5 WTC (9/93)
	5		Contract WTC 846.071: Modernization of Elevators and Escalators 2 WTC (3/94)
	6		WTC Agreement No. 990102: Provision of Construction Management Services on a "Call-In" Basis
	7		TDI Advertising Contract (The Mall)
	8		Contract WTC 799.60: Ironbound Flooring Installation
	9		Contract WTC 891.074: Purchase of Key & Lock Cylinder System (office space security system hardware)
	10		Contract WTC 799.47A: Maintenance Painting via Work Order 1, 2, 4 & 5 WTC
	11		Contract WTC 822.071: Emergency Power For Condenser Water System No. 1

ITEM	
12	Fire Alarm Maintenance Replacement Parts & Technical Services (Req. #52618)
13	Contract WTC 799.39: Maintenance of Centrifugal Refrigeration Machines with Supplemental Agreement and Extension
14	Contract WTC 799.710: Agreement to Perform Consolidated Electrical, Mechanical & General Maintenance Services
15	Contract WTC 799.688: Provide Maintenance of Six (6) Diesel Generators
16	Exercise of Option Period Agreement with Grand Central Neighborhood Social Services Corp. to Provide Labor for the Collection and Sorting of Recyclable Paper
17	Contract PSE - 727: Refinishing & Restoration Services of the Stainless Steel Surfaces – Concourse, Skylobby Levels of 1, 2, 4 & 5 WTC
18	Contract PSE - 801: Restoration of Stainless Steel & Other Metal Surfaces
19	Cleaning & Cleaning Related Services – Request for Proposals
20	Contract PSE - 864: Collection of Recyclable Waste Paper – Agreement with Manhattan Bowery Management Corp., NY
21	Contract PSE - 634: Trash Removal & Recycling Service at the WTC
22	Contract PSE - 821: Refuse Removal, Recycling & Disposal
23	Contract PSE - 821: Refuse Removal, Recycling & Disposal at WTC for 2 years
24	Contract PSE - 850: Removal of Construction Debris from the WTC
25	Contract WTC-463.00: Removal of Construction Rubbish, dated June 1995
	a Assignment and Assumption with Consent of Contract WTC-463.00: Removal of Construction Rubbish, dated October 1996
26	Contract WTC-697.00: Construction Labor Services
	a Amendment Number One to Contract WTC 697.00: Construction Labor Services
27	Contract WTC-457.03: Design Build Services for 1, 2 & 3 WTC

ITEM		
	28	Maintenance of Office Space Security System Software
	29	Contract WTC 799.56A: Agreement to Provide Fire Safety Director Service-1,2,4 & 5 WTC
	30	Design/Build Services for Tenants
	31	Contract WTC 799.690: Fire Alarm System Service Agreement for the World Trade Center Complex
	32	Contract WTC 115.300: Removal and Disposal of Vinyl Asbestos Floor Tiles and Other Asbestos-Containing Material Via Work Order (11/99)
	33	Contract WTC 881.072: Rehabilitation of B-1 Level (Truck Dock) Floor Slab (9/99)
I	**STRUCTURAL INTEGRITY INSPECTION REPORTS by LESLIE E. ROBERTSON**	
	1	Concourse, Subgrade, Marriott Back of House, 4 & 5 WTC Space Usage (11/20/98)
	2	Concourse, Subgrade, Marriott Back of House, 4 & 5 WTC Space Usage (12/24/97)
	3	River Water Pump Station (9/22/98)
	4	River Water Pump Station (4/28/95)
	5	Concourse Plaster Ceilings (9/18/98)
	6	Accessible Columns - 4 & 5 WTC (8/19/98)
	7	Elevator Pits & Machine Rooms - 1, 2, 4 & 5 WTC (10/30/99)
	8	Elevator Pits & Machine Rooms - 1, 2, 4 & 5 WTC (7/20/98)
	9	Elevator Pits & Machine Rooms - 1, 2, 4 & 5 WTC (12/18/97)
	10	Exterior Plaster Soffits - 4 & 5 WTC (7/20/00)
	11	Exterior Plaster Soffits - 4 & 5 WTC (7/15/98)
	12	Exterior Plaster Soffits - 4 & 5 WTC (8/31/96)
	13	Space Usage Survey - 1 & 2 WTC (6/15/98)
	14	Space Usage Survey - 1 & 2 WTC (7/31/97)

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15	Space Usage Survey - 1 & 2 WTC (9/20/96)
16	Space Usage Survey - 1 & 2 WTC (9/20/96)
17	Slurry Walls & Adjacent Slabs - 1 & 2 WTC (6/98)
18	Slurry Walls & Adjacent Slabs - 1 & 2 WTC (5/28/97)
19	Slurry Walls & Adjacent Slabs - 1 & 2 WTC (7/16/96)
20	Accessible Columns - 1 & 2 WTC (5/30/98)
21	Accessible Columns - 1 & 2 WTC (5/23/97)
22	Accessible Columns - 1 & 2 WTC (5/1/96)
23	Floor framing - 4&5 WTC (7/24/98)
24	Plaza Level Box Columns (5/8/98)
25	Lobby Ceilings - 1 & 2 WTC (5/1/98)
26	Lobby Ceilings - 1 & 2 WTC (6/30/97)
27	Accessible Columns - 4 & 5 WTC (1/26/98)
28	Marble Panel Wall Inspection - 3, 4, 5 & Concourse Level at WTC (1/15/98)
29	Marble Panel Wall Inspection - 3, 4, 5 & Concourse Level at WTC (10/1/97)
30	Concourse Ceilings (5/23/00)
31	Concourse Ceilings (1/7/98)
32	Television Mast - 1 WTC (1/7/98)
33	Television Mast - 1 WTC (8/14/95)
34	Floor Frequency Measurements - 1 & 2 WTC (4/20/95)
35	Fire Stairs - 1 & 2 WTC (4/28/95)
36	Accessible Columns - 4 & 5 WTC (4/28/95)
37	Accessible Columns - 1 & 2 WTC (4/14/95)
38	Natural Frequency Measurements - 1 & 2 WTC (4/12/95)
39	Slurry Walls & Slabs at Slurry Walls (4/3/95)

ITEM	
40	Slabs, Partitions, Finishes and Floor Framing - 1 & 2 WTC (4/1/95)
41	Marble Panels - 1 & 2 WTC (3/13/95)
42	Marble Panels - 1 & 2 WTC (10/1/97)
43	Marble Panels - 1 & 2 WTC (8/30/99)
44	Bracing of 1 & 2 WTC below Elev. 294' – 0" (3/1/95)
45	Marble Panels - 3, 4, 5 & 6 WTC & Concourse Level (2/22/95)
46	Hat Truss between Floor 107 & the Roof (2/21/95)
47	Lobby Ceilings (1/17/95)
48	Crown Framing Deterioration - 1 & 2 WTC (11/16/94)
49	Exterior Plaster Soffits - 4, 5 & 6 WTC (11/21/97)
50	Exterior Plaster Soffits - 4, 5 & 6 WTC (5/28/92)
51	Concourse Plaster Ceilings - 4 & 5 WTC (5/1/91)
52	Damper Testing - 1&2 WTC (5/28/96)
53	Subgrade levels - WTC Facility Condition Survey Report (3/96)
54	Floor Slabs, Partitions, Column Finishes - 1&2 WTC (12/10/97)
55	Mechanical Equipment Rooms - 1&2 WTC (5/99)
56	Mechanical Equipment Rooms - 1&2 WTC (4/12/96)
57	B5 & B6 Passageway & Storage Area -WTC Subgrade (8/12/97)
58	Concrete Slabs, Partitions Column Finishes & Floor Framing over Tenant Spaces -1&2 WTC (6/28/96)
59	WTC Spray Fire Protection Tower Spandrels & Diagonals (10/1/96)
60	Tower Subgrade Levels WTC Facility Condition Survey Report (3/96)
61	WTC River Pump Station, U.S. Customs House Soffit, Plaza Level Slab & Concourse Level Ceiling Facility Condition Survey Reports (6/96)
62	Northeast & Southeast Plaza Buildings Facility Condition Survey Report(11/95)

ITEM		
	63	Northeast & Southeast Plaza Buildings Facility Condition Survey Report (9/94)
	64	Report on WTC Sidewalks (MEDD Architects 7/2 7/99)
	65	WTC Subgrade Parking Garage Slabs (1/00)
	66	1,2,4 & 5 WTC, Floor Framing (11/29/99)
	67	4 & 5 WTC, Mechanical Equipment Rooms (10/99)
	68	1 WTC, Pedestrian Access Bridges (9/28/99)
	69	4 & 5 WTC, Cantilever Trusses & Exterior Plaster Soffits (9/99)
	70	1 & 2 WTC, Floor Framing Inspection, Action Memo 1 (8/23/99) & Action Memo 2 (9/8/99)
	71	4 & 5 WTC, Floor Framing - Action Memo 1 (8/10/99)
	72	6 WTC Exterior Plaster Soffits (7/16/99)
	73	1 WTC, Natural Frequency Measurements (7/11/00)
	74	1 & 2 WTC, Crown Framing (6/30/99)
J	FACADES	
	1	Curtainwall - 1&2 WTC (Facades)
	2	Curtainwall and Roof Inspection - 1&2 WTC (10/29/99)
	3	Curtainwall - 4&5 WTC (Facades)
	4	Curtainwall and Roof Inspection - 4&5 WTC (4/28/95)
	5	Curtainwall and Roof Inspection - 4&5 WTC (10/9/98)
	6	1996 Structural Integrity Inspections - 1&2 WTC Facades
	7	1997 Structural Integrity Inspections - 1&2 WTC Facades
	8	1998 Structural Integrity Inspections - 1&2 WTC Facades
	9	Curtainwall reinspection 10% (10/29/99)
K	MECHANICAL REPORTS/INFORMATION	
	1	Maintenance Management Evaluation (6/99)
	2	Steam trap evaluation report (8/6/99)

ITEM		
3	Lucius Pitkin's Eddy Current Survey	
	a.	York Centrifugal Unit 2 (6/22/98)
	b	York Centrifugal Unit 3 (6/22/98)
	c	York Centrifugal Unit 5 (6/22/98)
	d	York Centrifugal Unit 6 (6/22/98)
	e	York Centrifugal Unit 1, 4 & 7-condensers and York Centrifugal Units 2, 3, 4-chillers (6/30/99)
	f	York Centrifugal Units 8, 9, 10, 11 & 12-condensers (7/21/99)
5	Summary memo of WTC River Water Lines (9/6/00)	
6	WTC 1,2,4,5 & Subgrade Air Handling Unit Rehabiliation (set of drawings) (5/13/98)	
L	VERTICAL TRANSPORTATION PROFILE & INSPECTION REPORTS	
1	Elevators	
	a.	1 WTC (Cars 1-99)
	b	2 WTC (Cars 1-99)
	c	4 WTC (Cars 1-12)
	d	5 WTC (Cars 1-9)
	e	Subgrade Cars-1WTC (P1, J1-J4)
	f	Subgrade Cars-2WTC (K1-K5)
	g	4WTC (FE1-FE4)
2	Escalators	
	a.	1 WTC: A1-A8
	b	2 WTC: B1 - B14
	c	S.E. Plaza (E14-E15)
	d	N.E. Plaza (E1-E13)
	e	PATH Escalators: P1-P11; P24; P27-P29
	f	Mall Escalators: E1, E2, E11-15, E17

ITEM		
3	Controller Manual s & Prints for Modernized Elevator Cars	
	a	ACE Elevator Co. CEC Futura Manual PA Contract #WTC 838.071, SEP Bldg. 4 Cars 1-6
	b	ACE Elevator Co. CEC Futura Manual Contract #WTC 838.071, SEP Bldg. 4 Cars 7-12
	c	ACE Elevator Co. CEC Futura Manual Contract #WTC 838.071, SEP Bldg. 5 Cars 1-6
	d	ACE Elevator Co. CEC Futura Manual & Diagram for Cars 12B, 13B PA Contract #WTC 846.071
	e	ACE Elevator Co. CEC Futura Manual Contract #WTC 845.071 SEP Bldg. 1 Cars 24A-29A
	f	ACE Elevator Co. CEC Futura Manual PA Contract #WTC 845.071, Bldg. 1 Cars 30A-35A
	g	ACE Elevator Co. Futura Manual & Magnetek DSD412 Manual Contract WTC 845.071, Bldg. 1 Cars 36A-41A
	h	ACE Elevator Co. CEC Futura Manual PA Contract #WTC 845.071, Bldg. 2 Cars 51A-56A
	i	ACE Elevator Co. Futura and Magnetek DSD412 Manual, Bldg. 1 Cars 87A-92A
	j	ACE Elevator Co. Controller Diagram for cars #93A-98A, PA Contract #WTC-845.071
	k	ACE Elevator Co. CEC Futura Manual PA Contract #WTC 845.071, 14 & 15A
	l	A.C.E. Elevator Co. Inc., Swift Futura, CEC Job No. 3331 cars 14A, 15A 1WTC Velocity/Fault Controller (1/29/9_)
	m	WTC Car 6B Setup Parameters
	n	A.C.E. Elevator Co. Inc., Swift Futura, CEC Job No. 2670 car 6B 2WTC Velocity/Fault Controller (4/18/95)
	o	Schematic Drawings, 2WTC-A.C.E. Elevator (Shuttle Cars) Job No. 3172, Cars 12B, 13B (3/20/97)
4	VDA Studies on WTC Elevator Fleet	
	a	Elevator door study (12/16/99)

ITEM		
	b	Examination of 1 WTC elevators 18-23 (5/11/00)
	c	Examination of 1 WTC elevators 1A-5A & 8A-11A (8/21/00)
	d	Examination of 2 WTC elevators 57B-62B & 87-92 (8/8/00)
	e	Examination of 2 WTC elevators 24B-29B (8/2/00)
	f	Examination of 2 WTC elevators 42B-47B (7/12/00)
	g	Examination of 2 WTC elevators 51B-56B (7/12/00)
	h	Examination of 2 WTC elevators 63B-68B (8/21/00)
	i	Examination of 2 WTC elevators 81B-86B (8/2/00)
	j	Examination of 2 WTC elevators 93B-98B (8/2/00)
	k	Examination of 1 WTC elevators 12A-17A (12/16/99)
	l	Examination of 1 WTC elevators 12A-17A (5/11/00)
	m	Examination of 2WTC elevators 1B-5B & 8B-11B (6/28/00)
	n	Examination of 2 WTC elevators 12B-17B & 18B-23B (8/21/00)
M	ELECTRICAL REPORTS	
1	Operations Services Department Inspection & Safety Division evaluation of the electrical maintenance program at WTC (2/99)	
2	Burlington Engineering Co. Thermographic Scanning NE & SE Plaza buildings (3books) (8/8/96)	
3	Burlington Engineering Co. Thermographic Scanning Subgrade levels including "A" Tower (6/17/96)	
4	Burlington Engineering Co. Thermographic Scanning "B" Tower (2 books) (8/8/96)	
5	Burlington Engineering Co. Thermographic Scanning "A" Tower (8/8/96)	
6	Electrical Capacity Upgrades Summary	
N	BLAST RELATED REPORTS/INFORMATION	

ITEM		
	1	WTC Explosion and Fire Environmental Investigation and Assesment Report
	2	Summary of Structural repairs as a result of February 26, 1993 Explosion (2 copies of 10 drawing sets)
	3	York Water Chiller System Post Blast Equipment Analysis
	4	Letter from Fire Department Attesting to Post-Bomb Adequacy of Life Safety Systems
	5	Description/Status of Fire System CADD
O	LIFE SAFETY CODE ANALYSIS (11/94)	
	1	ADA Transition Plan
	2	Contract WTC-799.56A Fire Safety Director Service 1,2,4 & 5 WTC
	3	Contract WTC-799.610 Maintenance of Office Space Security System Software at the WTC
	4	New Fire Alarm System description & status
P	TENANT CONSTRUCTION GUIDELINES	
	1	Tenant Construction Review Manual
	2	Fire Alarm Guidelines
	3	Electrical Communication
	4	HVAC, Plumbing & Fire Protection
	5	Architectural & Structural
	6	Pro Forma Applications
Q	MAPS & DRAWINGS	
	1	Tenant Location Plans / Space Book Plan
	2	Architectural Drawings of Property (10 CD-rom)
	3	Above-Grade Survey
	4	Detailed Retail Drawings
	5	Detailed Retail Drawings (4 CD-rom)
	6	CADD Drawings of the Subgrade

ITEM		
7	Highly Illustrative Subgrade Drawings	
8	Subgrade Drawings (4 CD-rom)	
9	Parking Map	
10	Damage Map Pertaining to the Acquisition of Certain Real Property by the PA for WTC	
11	Base Building One-Line System Drawing	
12	Stack Plans	
R	PUBLIC SPACE RENOVATION MASTER PLAN	
1	Davis, Brody& Associates World Trade Center Master Plan	
2	Renovation Development Proposal (LaSalle Partners)	
3	Renovation Development Proposal (The O'Conner Group)	
4	Renovation Development Proposal (LCOR/The Hahn Company)	
	a.	Volume 1: Development Team (2/1/95)
	b	Volume 2: Base Design Concept (2/1/95)
	c	Volume 3: Development, Management and Operating Proposal (2/1/95)
	d	Volume 4: Financial Proposal (2/1/95)
	e	Volume 5: Alternative Proposal (2/1/95)
	f	Volume 6: Design Concept, Retail Plan, and Events Presentation (2/16/95)
	g	Revised Proposal
4	WTC Preliminary Study to Reduce Plaza Windiness	
5	WTC Plaza Stone Site Investigation	
6	Smoke Management Design Criteria	
7	Life Safety Systems & Emergency Evacuation	
8	Halcyon Report, Area Worker and Visitor Survey	
S	AGREEMENTS	
1	Agreements/Memorandums of Understanding	

ITEM		
	a.	Union Agreements
	b	Power Authority of the State of New York Agreement
	c	Memorandum of Understanding ("MOU") with NYC Fire Department & Amendment
	d	MOU with NYC Building Department
	e	Agreement between the PA and NYC Pertaining to Certain Street Closings and a Change in the City's Waterfront Plan to Accommodate Certain Landfills being Created in Connection with the Development of WTC (6/67)
	f	Agreement between the PA and NYC Pertaining to Certain Street Closings in Connection with the Development fo WTC (1/68)
	g	Agreement between NYC, Fisher Liberty Co. and the PA Pertaining to the Liberty Street Pedestrian Bridge (8/76)
	h	Agreement between NYC and the PA Pertaining to the Liberty Street Underpass (5/12/80)
	i	Agreement between NYC and the PA Pertaining to the Dey Street Underpass (5/80)
	j	Settlement Agreement among NYC WTC7, and the PA Pertaining to the Vesey Street Deck (4/84)
T	LEGAL INFORMATION	
1	Pending Litigation Materials	
	a	Summons dated 11/10/99 with Dean Witter Reynolds Inc. against The Fund for Regional Development and Port Authority of New York and New Jersey (Index No. 605118/99)
	b	Answer dated 5/25/00 regarding Summons with Dean Witter Reynolds Inc. against The Fund for Regional Development and Port Authority of New York and New Jersey (Index No. 605118/99)
	c	Summons dated 1/7/00 with Guy Carpenter and Company Inc. against The Fund for Regional Development and Port Authority of New York and New Jersey (Index No. 600091/00), together with Complaint dated 12/29/99 attached thereto
2	Commonwealth Land Title Insurance Co. Documentation	

ITEM		
	a.	Title Commitment
	b	Copies of Recorded Easements and other Exceptions to Title
	c	Easement Agreement among PA, PATH, BPCD and BPCA (9/81) and Amendments thereto (2/82, 1/84)
	d	Letter from R. Gochfield, Dept. of City Planning, City of NY to H. Barr, PANYNJ re: Proposed Change in City Map for the WTC, with attached surveys
U	INTELLECTUAL PROPERTY INFORMATION	
	1	Schedule of Patents, Trademarks, Tradenames and Copyrights Held or Used and Documentation Relating to Related Claims
V	MISCELLANEOUS	
	1	Engineering Department Professional and Technical Service Firm Rosters for the Architectural, Electric, Environmental, Mechanical and Structural Disciplines
	2	World Trade Center Tenant Manual
	3	PA Comprehensive Annual Financial Report for the Year ended 12/31/99

ATTACHMENT 4

World Trade Center-Proposed 2001 Capital Plan

W[redacted] TRADE CENTER - PROPOSED 2001 CAPITAL F[redacted] ROUGH BREAKDOWN BY BUILDING[redacted]

($'s in thousands)

Proj Title	2001	Bldg 1	Bldg 2	Bldg 4	Bldg 5	Retail Mall	Subgrade	Central Sys
Electrical & HVAC Capacity Upgrade								
HVAC Distribution System Rehabilitation	1,000	400	400	100	100			
1 WTC 3d Zone Electrical & HVAC Capacity	1,000	1,000						
HVAC Control System/Smoke Mgmt	1,000					1,000		
HVAC Distribution Capacity Upgrade	2,500		2,500					
Freeze Protection Systems	1,000	1,000						
Plaza Bldg Electrical Capacity Upgrade	2,000			1,000	1,000			
New Fire Alarm System								
Fire Alarm System Phase 3 - PA Work	8,000	2,000	2,000	500	500		3,000	
Fire Alarm System Phase 3 - Tenant Reimb	250	100	100		50			
Other Building Systems Upgrades								
Operations Control Center	500							500
Tenant Standby Power	2,000							2000
Substation Ground Fault Protection	500							500
Antenna & Mast Rehabilitation Projects	500	500						
Building Mgmt/Energy Mgmt Systems	500							500
Common Area Improvement Programs								
Public Space Code Improvements	2,500					2,500		
Public Space Infrastructure Improvements	3,000					3,000		
Mall Circulation Improvements Phase 2	500					500		
Priority Customer Service Improvements	4,000	500	500			3,000		
Subgrade Rehabilitation Programs								
Subgrade Slab Rehabilitation Phase 1	10,000						10,000	
Subgrade Slab Rehabilitation Phase 2	500						500	
Subgrade Code Upgrade Projects	500						500	

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W TRADE CENTER - PROPOSED 2001 CAPITAL P - ROUGH BREAKDOWN BY BUILDING

($'s in thousands)

Proj Title	2001	Bldg 1	Bldg 2	Bldg 4	Bldg 5	Retail Mall	Subgrade	Central Sys
Security Programs								
Permanent Security Project	500							500
Office Space Security System	500							500
Security Modernization Projects	5,000							5,000
Elevator and Escalator Modernization Programs								
Elevator Control Modernization - Tower 1	3,500	3,500						
Elevator Control Modernization - Tower 2	3,500		3,500					
Plaza Bldg Elevator Control Modernization	500			250	250			
Asbestos Abatement Shuttle Shafts	500	500						
Elevator Disconnect Switches	1,000	500	500					
Tenant Space Prep/Landlord Work Projects								
Lease Obligated Capital Work	2,000	750	750			500		
Multi-Tenant Floor Corridor & Restrm Rehab	3,000	1,000	1,000			1,000		
Building Infrastructure Rehabilitation Programs								
Priority Capital Major Work Projects	500							
Capital Major Work Projects	5,000	1,000	1,000					2,000
Other Asbestos Abatement	500		250	250				
ADA Projects	250					125	125	
GRAND TOTAL	68,000	12,750	12,500	2,100	1,900	11,625	14,125	11,500

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ATTACHMENT 5

World Trade Center-Proposed 2002-2005 Capital Plan

WORLD TRADE CENTER - PROPOSED 2002-2005 CAPITAL PLAN - ROUGH BREAKDOWN BY BUILDING

($'s in thousands)

Proj Title	2002	2003	2004	2005	2002-2005	Bldg 1	Bldg 2	Bldg 4	Bldg 5	Retail Mall	Subgrade	Central Sys
Electrical & HVAC Capacity Upgrade												
HVAC Control System/Smoke Mgmt	2,000	3,000	5,000	5,000	15,000	2,500	2,500					10,000
HVAC Distribution Capacity Upgrade	2,000	2,000	3,000	3,000	10,000	2,000	4,000					4,000
Freeze Protection Systems	1,000	1,000	1,000	1,000	4,000	1,000	3,000					
Plaza Bldg Electrical Capacity Upgrade	2,000	2,000	2,000	2,000	8,000			3,000	3,000			2,000
New Fire Alarm System												
Fire Alarm System Phase 3 - PA Work	8,000	4,000	0	0	12,000						10,000	2,000
Fire Alarm System Phase 3 - Tenant Reimb	250	0	0	0	250	100	100	50				
Other Building Systems Upgrades												
Operations Control Center	500	500	500	500	2,000							2,000
Tenant Standby Power	2,000	2,000	2,000	2,000	8,000							8,000
Antenna & Mast Rehabilitation Projects	500	500	500	500	2,000	2,000						
Building Mgmt/Energy Mgmt Systems	1,000	1,000	2,500	2,500	7,000							7,000
Common Area Improvement Programs												
Public Space Code Improvements	2,000	2,000	2,000	2,000	8,000					8,000		
Public Space Infrastructure Improvements	5,000	5,000	5,000	5,000	20,000					20,000		
Mall Circulation Improvements Phase 2	2,000	5,000	6,000	5,000	18,000					18,000		
Priority Customer Service Improvements	3,000	3,000	3,000	3,000	12,000	2,000	2,000	1,000	1,000	6,000		
Subgrade Rehabilitation Programs												
Subgrade Slab Rehabilitation Phase 1	6,000	0	0	0	6,000						6,000	
Subgrade Slab Rehabilitation Phase 2	1,000	5,000	5,000	5,000	16,000						16,000	
Subgrade Code Upgrade Projects	1,000	1,000	1,000	1,000	4,000						4,000	

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WORLD TRADE CENTER - PROPOSED 2002-2005 CAPITAL PLAN - ROUGH BREAKDOWN BY BUILDING

($'s in thousands)

Proj Title	2002	2003	2004	2005	2002-2005	Bldg 1	Bldg 2	Bldg 4	Bldg 5	Retail Mall	Subgrade	Central Sys
Security Programs												
Office Space Security System	250	250	250	250	1,000	400	400	100	100			
Security Modernization Projects	3,000	3,000	3,000	3,000	12,000							12,000
Elevator and Escalator Modernization Programs												
Elevator Control Modernization - Tower 1	3,500	3,500	3,500	3,000	13,500	13,500						
Elevator Control Modernization - Tower 2	3,500	3,500	3,500	3,000	13,500		13,500					
Asbestos Abatement Shuttle Shafts	500	500	500	500	2,000	1,500	500					
Elevator Disconnect Switches	500	0	0	0	500	250	250					
Tenant Space Prep/Landlord Work Projects												
Lease Obligated Capital Work	2,000	3,000	3,000	3,000	11,000	4,000	4,000	1,000	1,000	1,000		
Multi-Tenant Floor Corridor & Restrm Rehab	3,000	3,000	3,000	2,000	11,000	4,500	4,500	1,000	1,000			
Building Infrastructure Rehabilitation Programs												
Priority Capital Major Work Projects	500	500	500	500	2,000							2,000
Capital Major Work Projects	5,000	5,000	5,000	5,000	20,000	2,000	2,000	500	500			15,000
Other Asbestos Abatement	500	500	500	500	2,000	600	600	150	150		500	
ADA Projects	250	250	250	250	1,000	100	100			800		
GRAND TOTAL	61,750	60,000	61,500	58,500	241,750	36,450	37,450	6,800	6,750	53,800	36,500	64,000

ATTACHMENT 6

R.W. Crandlemere & Associates Environmental Site Assessment Phase I Report
(Separate binder)

ATTACHMENT 7

BOCA Group International, Overall Observation

BOCA GROUP
INTERNATIONAL, INC.
VERTICAL TRANSPORTATION CONSULTING

December 5, 2000

Mr. Robert Weiland
Merritt & Harris
110 East 42nd Street
Suite 1200
New York, NY 10017-5685

RE: **ONE, TWO, FOUR & FIVE WORLD TRADE CENTER**
OVERALL OBSERVATION

Dear Mr. Weiland:

Our engineers performed a visual observation and reviewed contracts and documentation, as listed below, of the elevators at the above referenced projects. The elevators and escalators were observed on a "specimen sample" basis. A few units from each building were observed, and these were broken down into units where the "complete modernization" was finished and units where modernization had not been performed as of November 1, 2000. According to the specifications, the modernization is being performed in two phases, the Overlay Modernization Phase and Complete Modernization Phase.

List Of Documents Reviewed

We also reviewed a few documents at the Port Authority Vertical Transportation Office. The following is a list of the documents we observed:

1. World Trade Center Property Book
2. Offering Memo
3. The Port Authority of NY and NJ
   - The World Trade Center Contract WTC – 845-071 "Modernization of Elevators, Dumbwaiters and Escalators @ One World Trade Center" March 1994
   - The World Trade Center Contract WTC – 838-071 "Modernization of Elevators and Escalators @ Four and Five World Trade Center" September 1993
   - The World Trade Center Contract WTC – 846-071 "Modernization of Elevators and Escalators @ Two World Trade Center" March 1994

200 PARK AVENUE • NEW YORK, NY 10166
TELEPHONE (212) 983-7010 • FAX (212) 983-7011 • E-MAIL info@bocagroup.com
www.bocagroup.com

- Maintenance Contract for World Trade Center - 799.700 Maintenance.

4. VDA Maintenance Surveys
   i. dated June 14, 2000 (Elevators 1A – 5A, & 8A – 11A
   ii. dated August 2, 2000 (WTC tower "B" Local Elevator nos. 63, 64,65,66,67 & 68)
   iii. dated August 21, 2000 (Elevators 81B – 86B)
   iv. dated October 16, 2000 (Elevators 75B – 85B in Two WTC)

5. Correspondence dated October 17, 2000 from the Port Authority to ACE Elevator Company.

6. Monthly callback summaries on elevators with greater than two outages (April, May, June, August, September and November, 1999; January –May 2000 and July –October 2000) for One World Trade Center and Two World Trade Center.

7. OCC DECK Reports dated 10/16/00 and 11/1/00.

FORM OF REPORT:

Following this overall observation, is a summary of the scope of work included in the modernization of the elevators located within the World Trade Center.

A status of the elevator modernization program follows the overall observations. The sub-grade units are listed immediately following the status report, which is followed by a listing of the tenant units and the retail units that we observed in the layout drawings.

A section discussing the current maintenance being performed follows the previously described sections.

Detailed reports on the individual buildings follow the status of the elevator modernization. These reports describe the equipment that we observed and also list information that we gleaned from the documents that we reviewed.

At the end of each section are the traffic calculations and analyses for the various buildings. Please note that these calculations do not include any of the tenant owned and operated elevators

The following sections include reports for the individual buildings.

GENERAL NOTES

The four buildings have a total of 238 elevators 126 of them have been modernized, 8 already in progress and 104 not yet started but scheduled for a future date. Most of the modernized elevators have SCR Drives with CEC Swift Futura Controllers, door operators retrofitted with solid state controls to interface with the new controllers all

giving the elevator better service and a better quality ride. All passenger elevators have had cab refurbishing, all but two are ADA compliant.

Due to a previous elevator incident at Two World Trade Center elevators 18-23B were excluded from our inspection.

Five tenant owned and operated elevators were not observed and form part of this report by reference only.

Upon inspection of the hoistway we observed the hoistway doors are fire rated with UL certification labels. To provide a statement on the hoistway walls being fire rated, a sampling would be necessary. This was not performed during our inspection which was of a visual nature.

All Escalators have been modernized with start/stop switch, comb plate switch, demarcation lights, caution signs, controlled descent devices, remote monitoring system, Carl White device (new for every device).

The PATH Escalators are excluded from the scope of this report.

SPECIAL ELEVATOR FEATURES

Track and saddle inserts have been installed predominately in tower shuttles and D Bank reducing friction between saddle and gibs minimizing stack effect problems on elevators.

Buildings One World Trade Center and Two World Trade Center provide a warning device, located on the 108 Floor, which rates the wind sway that automatically reduces the speed of the elevators to prevent possible damages. Accordingly, the shuttle elevators have the ability to have speed reduced automatically from 1600 Feet Per Minute to 1000 Feet Per Minute whenever strong wind conditions are observed and a warning system is activated as described below.

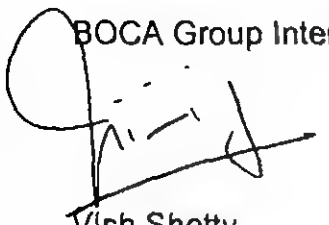
In buildings One World Trade Center and Two World Trade Center, elevators Nos. 14 and 15 have hoistway wall roller followers, which have proven to be successful in minimizing wall erosion due to rope contact. The followers are installed on all the high-rise shuttles, elevator Nos. 6 and 7 in each tower.

In all buildings the elevators can be recalled down to their respective lobbies via the elevator start consoles.

We hope you find this report useful in the due diligence analysis of the aforementioned properties. If you have any questions, please call the undersigned at (212) 983-7010

Sincerely,

BOCA Group International, Inc.,



Vish Shetty

Elevator Modernization – Summary of Scope of Work
(As of 11/1/2000)

Shuttle Elevators

Removal of existing equipment, designing, fabricating, delivering and installing an operating overlay prior to ordering full modernization.

Removal of existing equipment, designing, fabricating, delivering and installing a complete modernized elevator.

Remove existing motor generator, design, deliver and install new silicone controlled rectifier (SCR) power conversion units.

Design, fabricate, deliver and install revised emergency power operation line starter selection.

Removal of existing hall call fixture and designing, fabricating, delivering, and installing of a new hall call fixture.

Removal of existing hall lanterns and designing, fabricating, delivering and installing of new hall lanterns.

Removal of existing jamb markers and designing, fabricating, delivering and installing of new jamb markers.

Design, fabricate, deliver and install new car to lobby (CTL) key switch with updated wiring changes.

Local Elevators

Removal of existing equipment, designing, fabricating, delivering and installing an operating overlay prior to ordering full modernization.

Removal of existing equipment, designing, fabricating, delivering and installing a complete modernized elevator including SCR drives and microprocessor based controllers.

Design, fabricate, deliver and install new car to lobby (CTL) key switch with updated wiring changes.

Design, fabricate, deliver and install revised emergency power operation line starter selection.

Removal of existing hall call fixture and designing, fabricating, delivering and installing of a new hall call fixture.

Removal of existing hall lanterns and designing, fabricating, delivering and installing of new hall lanterns.

Removal of existing jamb markers and designing, fabricating, delivering and installing of new jamb markers.

Freight Elevators

Removal of existing equipment, designing, fabricating, delivering and installing an operating overlay prior to ordering full modernization.

Removal of existing equipment, designing, fabricating, delivering and installing a complete modernized elevator including SCR drives and microprocessor based controllers.

Removal of existing door protective devices and designing, fabricating, delivering and installing of door protective devices.

Provide new freight elevator hall lanterns at each landing served. This includes designing, fabricating, delivering and installing new hall lanterns.

Removal of existing jamb markers and designing, fabricating, delivering and installing of new jamb markers.

Status of WTC Elevator Modernization Program

(as of 11/1/2000)

	1 WTC		
	Complete	In Progress	Future
Local	56	3	13
Low-Rise	0	0	8
High-Rise	6	0	7
Freight	2	0	4

	2 WTC		
	Complete	In Progress	Future
Local	37	2	33
Low-Rise	0	0	8
High-Rise	6	2	5
Freight	1	0	5

	4 WTC		
	Complete	In Progress	Future
Local	11	0	1
Freight	0	0	2

	5 WTC		
	Complete	In Progress	Future
Local	7	1	1
Freight	0	0	2

SUBGRADE		
Complete	In Progress	Future
0	0	15

SUB-GRADE ELEVATORS

ELEVATORS SERVING SUB-GRADE ONLY

ELEVATOR	FLOORS SERVED
K2	Front: B1 Rear: B4, B5, B6
K1	1, B1
FE5	B1-B3
FE8	43-44
J4	1, B1
FE1	B2, B1, 1
FE2	B2, B1, 1
FE3	B1, 1, 2-9
FE4	B1, 1, 2-9

ELEVATORS SERVING SUB-GRADE IN ADDITION TO OTHER FLOORS

ONE WORLD TRADE CENTER

ELEVATOR NUMBERS 50, 7, 49, 17, 48, 5, ARMOR CAR, ALL "J" CARS, 36, 41, 42, 47, 35, 30, 29, 24.

TWO WORLD TRADE CENTER

ELEVATOR NUMBERS 50, 7, 49, 17, 48, 5, ARMOR CAR, ALL "K" CARS, 36, 41, 42, 47, 35, 30, 29, 24.

TENANT ELEVATORS AND ESCALATORS

FIVE WORLD TRADE CENTER

UNIT TYPE	UNIT NUMBER	FLOORS SERVED	# OF UNITS
ESCALATOR	CSE 1 AND CSE 2	2 TO 3AND 3 TO 2	2
ESCALATOR	NONE	1 TO 2, 2-3 AND 3-2	3
HYDRAULIC ELEVATOR	BORDERS BOOK STORE	1,2,3	1

FOUR WORLD TRADE CENTER

UNIT TYPE	UNIT NUMBER	FLOORS SERVED	# OF UNITS
ELEVATOR	1 AND 2	1, 3, 4, 5 6	2
ELEVATOR	SWISS BANK	NOT AVAILABLE	1

RETAIL ESCALATORS

We have been informed by the Vertical Transportation Department of the Port Authority of NY and NJ that these units incur unusually high maintenance costs due to high traffic volume and also due to the fact that these escalators are used to transport handcarts and other wheeled carriages.

ONE WORLD TRADE CENTER

NONE

TWO WORLD TRADE CENTER

NONE

FOUR WORLD TRADE CENTER

ESCALATORS NEAR LIBERTY STREET BETWEEN HSBC ATM AND NEWS STANDS (2 UNITS) (E14 AND E15)

ESCALATORS BETWEEN AU BON PAIN (E17 AND E18), VICTORIA'S SECRET AND BATH AND BODY WORKS

FIVE WORLD TRADE CENTER

CONCOURSE TO PLAZA (E19 AND E20)

ESCALATORS BETWEEN NINE WEST AND TOURNEAU STORES (2 UNITS) (E1 AND E2)

ESCALATORS TO SIX WORLD TRADE CENTER NEXT TO CHOICE COURIER (2 UNITS)

ELEVATOR MAINTENANCE

We performed a visual inspection of the 21 pre-selected elevators and a few escalators in buildings One, Two, Four, and Five World Trade Center, we have gathered that the equipment has to be closely monitored by the Vertical Transportation Department of the World Trade Department. We have also reviewed maintenance evaluation reports submitted by an independent third party based upon their field observations. These reports indicate deficiency items mostly related to house keeping, some of which remain to be corrected. The indications on the third party reports in reference to the preventive maintenance practices range from "acceptable" to "marginally acceptable" with "definite room for improvement in the area of housekeeping". Nevertheless, it appears from the correspondence we observed and during our general discussions that a great deal of close monitoring and follow up from the Vertical Transportation Department is required for the elevator maintenance company to respond to schedule requests as well as perform preventive maintenance. We understand that the elevator company does not inform the PA about any past problems or future repairs that need to be scheduled as a result of which the problems persist.

Additionally, we reviewed the maintenance callback sheets listed previously after which we performed a visual inspection of additional machine rooms in One World Trade Center and Two World Trade Center. This field visit revealed a large amount of rouged cables and bad machine bearings. The rouged cables are contributing largely to the amount of dust and dirt in the machine room, on the machine room equipment and secondary equipment. This condition will most likely cause contact failures, electrical shorts and other potential hazards to the equipment and its workers. There was a significant amount of bad machine bearings observed which are causing noise and vibration in the machines. If this is not corrected soon more serious damage will be caused to the hoist machines.

It was also noted that a few elevators had temporary jumpers on the controller, which is not a generally accepted practice in the elevator industry and could be potentially dangerous.

The following section describes some of the significant deficiencies that we observed all of which are covered under the full-service maintenance contract in effect.

SIGNIFICANT MAINTENANCE ITEMS

ONE WORLD TRADE CENTER

Major Maintenance Items:

1. Excessive dust in all machine rooms observed
2. Rouged cables on Elevators 74, 1, 4, 66, 58, and 60
3. Cables with breaks on Elevators 63 and 64

4. Defective machine bearings on Elevators 72, 46 and 61

Other Maintenance Items:

Elevators Nos. 63 - 68:
Elevator No. 63 - Many breaks in cables.
Elevator No. 64 - Many breaks in cables.
Elevator No. 65 - Relevels many times, Cables are filthy
Elevator No. 66 - Slightly rouging of hoist cables.
Elevator No. 68 - Excessive carbon dust in hoist motor.

Elevators Nos. 57 - 62:
Elevator No. 58 - Cables have excessive rouging - all in machine.
Elevator No. 59 - Carbon dust excessive in hoist machine.
Elevator No. 60 - Rouge in cables
Elevator No. 61 - Vibration in main bearing and excessive carbon dust in machine.

Elevators Nos. 49, 69 - 74:
Elevator No. 49 - Four temporary jumpers on controller. Large amount of dust in hoist machine and motor.
Elevator No. 69 - Excessive rouge dust in hoist machine.
Elevator No. 72 - Bad main bearing - whole machine rocks.
Elevator No. 73 - Rouge dust around and in internal brake.
Elevator No. 74 - Excessive cable rouge - all over and in machine.
Rouge on Machine room floor.

Elevator No. 16 - Cable has broken lay. Secondary rouged cables - rouge all over machine room. We were informed that one of the hoist cables broke, started untwisting and came in contact with metal causing a spark, which started a fire in secondary. Elevator shut down for repairs.

Elevator No. 74 - Cables rouged - Rouge all over machine room.

Elevator No. 72 - Bad main bearing - machine rocks.

Elevator No. 1 - Excessive cable rouging condition and excessive oil on brake pads.

Elevator No. 4 - Excessive cable rouge.

Elevator No. 46 - Bad main bearing and cables are rouged.

TWO WORLD TRADE CENTER

Major Maintenance Items:

1. Rouged cables on Elevators 8, 9, 63-68 ,72, 2, 7, K5, 26 and 28.
2. Bad machine bearings on Elevators 11, 56, 73 and 26
2. Excessive dust in machine room.

Other Maintenance Items:

Elevators Nos. 1-5:
No. 1 Elevator - Carbon dust in hoist motor - cables rouged all over. Oil on brake pads.
No. 2 Elevator - Cables rouged all over - Pie Plate Selector very noisy.

Elevators Nos. 6, 7, 50 and 99: Carbon dust in all hoist motors
No. 6 Elevator - Oil on brake pads.
No. 7 Elevator - Rouged cables caused excessive rouge deposits all over machine.
No. 49 Elevator - Jumper on controller, rouge all in controller, carbon dust excess in hoist motor.

Elevators Nos. 12 - 17: Dust in all machines
Elevator No. 16 - Excess carbon dust in hoist motor & rouge on drive sheaves.
Elevator No. 14 - Car oil seepage in main bearing sheave side

Elevators Nos. K3 - K5:
Elevator No. K5 - Rouge on cables - Not bad.

Elevators Nos. 24-29:
Elevator No. 26 - Bad main bearing and cable rouging.
Elevator No. 28 - Cable have rouging - rouge in hoist machine.
Elevator No. 27 - Rouge dust in hoist machine.

Low Rise Shuttles
Elevator No. 8B - Cables rouged causing rouge all over machine room.
Elevator No. 9B - Cables rouged causing rouge all over machine room.
Elevator No. 10B - Low Brushes and rouge all over machine room.
Elevator No. 11B - Bad main bearing and rouge all over machine room.

Elevators Nos. 51 - 56:
Elevator No. 56 - Bad main bearing

Elevators Nos. 57 - 62:
Elevator No. 62 – Full size hoist motor brushes are not in contact with commutator. Many brushes are low.

Elevators Nos. 63 - 68:
Elevator No. 63 - Cables rouged.
Elevator No. 64 - Cables rouged.
Elevator No. 65 - Cables rouged.
Elevator No. 66 - Cables rouged causing rouge all over hoist machine.
Elevator No. 67 - Cables rouged causing rouge all over hoist machine.
Elevator No. 68 - Cables rouged all over, and oil leak in main bearing.

Secondary – There are thick amounts of rouge all over. Generator copper shavings inside and carbon excessive

Elevators Nos. 69 - 74:
Elevator No. 72 - Car cables rouged; rouge all over machine room.
Elevator No. 73 - Main bearing real bad, whole machine shakes.

MAINTENANCE ITEMS

The two OCC Deck reports show many long outstanding maintenance items, some dating as far back as March 2000. This is indicative of poor response from the elevator company.

CALLBACKS

The following charts summarize the callback information that was provided to us as indicated in item #6 under the list of documents reviewed.

A review of the charts will indicate an excessive amount of callbacks on both old units and new units. Although all callbacks may not be attributed to poor maintenance, they are a good indicator of preventive maintenance and while difficult to eliminate totally, can be minimized with a good maintenance program in place. The excessive callbacks shown on the charts for some units are especially unacceptable on the modernized elevators. (The average number of callbacks (>2 only) for new units (for 15 months) is 5.75 for One World Trade Center and 3.45 for Two World Trade Center). As per one of the major elevator manufacturers and installers, an acceptable shutdown frequency for a controller related problem would be one per year per elevator.

ELEVATORS WITH >2 CALLBACKS

MONTH	ONE WORLD TRADE CENTER			TWO WORLD TRADE CENTER		
	OLD UNITS	NEW UNITS	TOTAL	OLD UNITS	NEW UNITS	TOTAL
Apr-99	73	9	**82**	48	3	**51**
May-99	45	13	**58**	58	14	**72**
Jun-99	58	22	**80**	34	13	**47**
Aug-99	29	20	**49**	17	10	**27**
Sep-99	20	29	**49**	36	14	**50**
Nov-99	34	46	**80**	40	14	**54**
Jan-00	21	9	**30**	32	10	**42**
Feb-00	34	15	**49**	18	16	**34**
Mar-00	34	37	**71**	51	10	**61**
Apr-00	16	29	**45**	31	18	**49**
May-00	30	25	**55**	29	6	**35**
Jul-00	25	37	**62**	29	6	**35**
Aug-00	25	14	**39**	29	7	**36**
Sep-00	6	21	**27**	21	4	**25**
Oct-00	17	42	**59**	44	7	**51**
TOTAL	**467**	**368**	**835**	**517**	**152**	**669**

TOTAL UNITS WITH >2 CALLBACKS		
	ONE WORLD TRADE CENTER	TWO WORLD TRADE CENTER
Apr-99	15	10
May-99	11	14
Jun-99	18	11
Aug-99	11	7
Sep-99	8	11
Nov-99	17	14
Jan-00	9	10
Feb-00	13	7
Mar-00	17	12
Apr-00	8	13
May-00	13	10
Jul-00	10	12
Aug-00	11	8
Sep-00	7	5
Oct-00	13	11

SECTION V – EXISTING PROPERTY DESCRIPTIONS & CONDITIONS

A. Overall Project

Overview

The Subgrade includes the 70' deep slurry wall, the projections and much of the 6-cellar level area (B-1 to B-6), situated within the volume bounded by the perimeter slurry wall. The slurry wall was installed to facilitate a dry excavation for the foundations for both towers of WTC, the Customs Building, and the Marriott Hotel. The Subgrade also includes both loading dock areas. The main loading dock is located between 1 and 2 WTC on the B-1 level. The Plaza Building dock is located adjacent to Buildings 4 and 5.

All Central Plant equipment and the walls and structure enclosing Central Plant equipment spaces are excluded from Subgrade and considered as a separate section referred to as Central Plant.

The 6 basement levels (B-1 to B-6) of the two Towers; the U.S. Customs Building basement on B-1 level; the loading docks on B-1 assigned to Customs; and the PATH right-of-way (ROW) is excluded from the Subgrade (Levels B-3 to B-6) are excluded from Subgrade.

The J and K elevator banks that serve the 3 parking levels are excluded from Subgrade and are considered as part of the two Towers. Marriott Hotel mechanical equipment rooms on Level B-1 are excluded. The former PATH generating plant on B-2 Level under the 2nd set of loading docks at old PATH station is not included in Subgrade, but is considered part of Buildings 4 and 5, since the space is considered leasable.

Vehicle parking is restricted by the Port Authority to tenants and others with parking passes, as a security precaution. Restriction is accomplished by manned security booths, Delta barriers, and an electronic access control system.

Built-Circa

1970

Certificate of Occupancy

A Certificate of Occupancy has not been issued by the City of New York because property owned by the Port Authority is not subject to the Building Code of the City of New York. We have observed "Permits to Use or Occupy" issued by the Port Authority for specific work, notably the October 10, 1997, Permit issued following completion of repairs following the 1993 bombing, but the Port Authority did not routinely issue the equivalent of a base building Occupancy Certificate until January 1992. In addition, in December 1995, the Port Authority started an optional "Professional Self-Certification" program for alteration work by tenants. The PA has issued "Consent to Occupy" certificates for specific work under this program.

Story Height

B-1 - 16'
B-2 - 10'
B-3 - 10'
B-4 - 10'
B-5 - 11'
B-6 - 11'

Number of Stories

6 cellar levels (B-1 to B-6) in an area within the slurry wall perimeter, and 1 story at abandoned PATH station

Depth

The overall cellar depth from the Concourse Level to Level B-6 is approximately 68'.

Total Sq. Ft. (Bldg. Area)

A survey was not provided. The footprint of the Subgrade is estimated from information provided by the Port Authority at 450,000 sq. ft before any deductions for the footprints of the 2 Towers (6 levels) and the US Customs building (1 level). Removing the 2 Tower cellar footprints, the Customs cellar footprint, and the Marriott space, reduces B-1 to an area of 260,000 sq. ft. B-2 does not have a footprint of Customs or the Marriott and its area is estimated at 365,000 sq. ft. The B-3 and B-4 levels are reduced by the PATH mezzanine ROW and Central Plan. B-3 is estimated at 280,000 sq. ft. and B-4 at 240,000 sq. ft. The B-5 and B-6 levels are reduced almost in half by the PATH tracks and station ROW and are estimated at 120,000 sq. ft. A significant portion of Levels B-4 to B-6 is used for the Central Plant equipment purposes.

The reported garage stall count is 1,300 cars located on Levels B-2 to B-4.

The main truck dock has provisions for approximately 24 trucks. It has rubbish compaction equipment located in several of the docks. There are additional loading stations that are assigned to the Customs building

The second truck dock has provisions for approximately 20 trucks.

General Breakdown of Floor Uses

Floors	Predominate Uses
B-1	Truck docks at north end, construction shanties at Marriott area, truck docks at old PATH station
B-2	Vehicle Parking, storage
B-3	Vehicle Parking, storage
B-4	Vehicle Parking, Central Plant
B-5	Storage and Central Plant
B-6	Storage and Central Plant

Special Features

Since parking is limited due to security, portions of the cellar on B-2 to B-4 could be used for other income purposes (Subject to Code and Zoning).

Design Team

Architect	Minor Yamasaki & Associates Emory Roth & Sons, P.C.
Structural Engineer	Worthington Skilling Helle & Jackson
Mechanical Engineer	Jaros Baum & Bolles
Electrical Engineer	Joseph R. Loring & Associates
Paving Utilities & Foundations	The Port of New York Authority

Recent Renovations

A 2-year program to replace the main B-1 truck dock slab concrete has started.

B. Project Condition

Structures

The concrete slabs at the main truck loading level are displaying usage-related deterioration, and deterioration from chloride attack from snow melting chemicals brought in by vehicles. The parking areas at the north and south section of Level B-2 and south section of B-3 and all of B-4 parking levels have significant spalling slab problems and a slab replacement program is anticipated to be necessary. The north section of B-3 has had the slab replaced.

The slurry wall has seepage that is contained by curbing and leaders, and disposed of to sump pumps in the lowest levels. The slurry wall and the adjacent floor slabs that brace the wall, should be inspected every few years to insure that unsafe conditions do not develop. Structural Integrity Inspection (SII) Report 38 (Data Room List), dated April 3, 1998, found the conditions to be acceptable.

Where they could be seen, the building's structural elements appear to be free from distress, settlement, and overloading. However, fireproofing of beams and girders was damaged or missing in significant areas of the truck loading docks and drive aisles. A column by the ramp up to Level B-2 was missing fireproofing.

All the 1993 bomb blast damage has been repaired and accepted by the Port Authority.

Interiors

Parking garage area finishes are good with painted columns and good lighting. The non-public areas are typically in need of cleanup and painting. Exit stairs typically require cleanup and repainting, and stair doors require hardware repair. The Projections require a thorough power wash cleaning.

Vertical Transportation

The elevators that serve the B-1 to B-6 Subgrade spaces are included within the other sections of the report. The elevators serving the Plaza Building truck dock are included with Buildings 4 and 5, or with the Concourse. There is 1 elevator (K-2) within the refrigeration equipment room to move Central Plant equipment delivered through the PATH tracks on Level B-5, or from the main loading dock area. Maintenance of this elevator is Central Plant responsibility. Large pieces of equipment for the Central Plant are delivered by contractor supplied rigging. In summary, approximately 33 freight and passenger elevators have access from the various buildings to the Subgrade loading and parking facilities.

HVAC

The mechanical systems are adequately designed, using brand name equipment, and provide adequate heating, ventilation and in certain areas air conditioning for the Subgrade spaces. Cooling is provided for office spaces located within the Subgrade areas, and was designed to fit the needs of the specific use. Cellar levels within the two Towers are cooled by the Towers' MERs. The equipment has been maintained in operating condition, but most equipment is original (30 years old), and has or will exceed its published service life over the next 10 years. Equipment or component maintenance is performed as part of the ABM service contract. It is recommended that carbon monoxide sensing equipment be located throughout the parking areas and loading dock in order to safeguard personnel who work in these areas for extended periods of time.

Plumbing

The plumbing systems appear to be in generally good condition and are reportedly functioning satisfactorily. Although in operation, replacement of the sump and ejector pumps should be anticipated over the next 10 years. Some piping modifications were observed to be in progress during our site observation.

Electrical

The electrical systems are reportedly functioning satisfactorily. Power is taken from the substations as needed to supply the Subgrade areas, as well as the Central Plant equipment.

Life Safety

The life safety systems are typical for a supporting substructure garage, Central Plant and storage area. A new fire alarm system is currently being installed project wide. Some of the sprinkler heads observed in the loading dock area were painted or covered with spray fireproofing. These should be surveyed and replaced as needed.

Property Maintenance

Overall maintenance of structural portions of the Subgrade is considered neglected and below average, with slab spalling and missing fireproofing being the predominant problems. Public Areas are clean and maintained adequately. Housekeeping in the utility areas and in the exit stairwells is poor. Generally the maintenance contractor (ABM) gives precedence to equipment maintenance over housekeeping and painting. In general, equipment maintenance appears to be adequate.

Accessibility

The parking garage areas have ramps that allow wheelchair access to the elevators in each tower, which are equipped for ADA compliance.

Violation Status

As stated in the Offering Memorandum, "The Port Authority is a municipal corporate instrumentality and political subdivision of the States of New York and New Jersey which provides transportation, terminal, and other facilities of commerce within the Port District. As such, in connection with the Transaction, the PA will continue to maintain exclusive jurisdiction with respect to certain administrative and governmental matters involving the Complex, including compliance with building, environmental, fire and health codes." The New York City Department of Buildings has indicated that they do not maintain any records of violations for this property. A request for a Property Profile Overview for this block and lot number yields no records. The Fire Department provides normal fire fighting and a life safety service to the facility. A Memorandum of Understanding exists between the Port Authority and the Fire Department in which the Fire Department performs regular inspections and directly notifies the Port Authority Fire and Life Safety group of deficiencies to be corrected. Under a protocol with the New York City Fire Department, Port Authority Police personnel investigate certain fire alarms at the World Trade Center rather than transmitting such alarms to the New York City Fire Department.

C. Site

Vehicular access for automobiles is limited to pre-screened tenants on a rental basis, to selected Port Authority employees, and to contractors having an agreement with the Port Authority for parking privileges. There are 4 ramps for access to the automobile parking areas from West Street; 1 entrance and 1 exit ramp (Ramps C and D) on the north section of the property, and 1 entrance and 1 exit ramp (Ramps A and B) on the south section of the property. There is an entrance ramp (Ramp H) on the south end of the property on Liberty Street. These ramps are protected by guard station checkpoints and Delta barriers, which are mechanically operated barriers, which swing up out of the pavement to physically block the ramp.

Freight delivery access (and a parking entrance) is by means of a ramp from Barclay Street, one block north of the site. This ramp passes under an adjacent building, 7 World Trade Center. It is protected by a security checkpoint and Delta barrier.

All entrances have mechanically operated roll-down metal gates.

D. Building Description

1. Structure

Foundation

The foundations of Buildings 1, 2, 3 (Marriott Hotel), and 6 (US Customs), and the interconnecting Plaza and Mall Concourse are situated within a common 6-level deep (70') Subgrade space which is enclosed by 3' thick concrete cut-off walls installed by the slurry trench method. This method involves trenching into the earth, while filling the excavation with Bentonite (fluid clay), until the bottom of the trench is reached, which includes a key into the bedrock. The Bentonite prevents the sides of the trench from collapsing during digging. Structural steel reinforcing is lowered into the trenches, and concrete is then tremied into the cut from the bottom up, displacing the Bentonite. When the wall is installed to the top, excavation begins, and tieback anchor rods are installed at intermediate levels to hold the wall in place as excavation proceeds to reach foundation level. The cellar slabs, when placed, provide permanent lateral bracing for the slurry walls allowing the tiebacks to be cut out. The 6 cellar levels are below the water table, and seepage through the slurry walls is controlled by perimeter curbs that channel water floor to sump pumps located in the lowest (B-6) level.

Levels B-1 to B-6 are supported by reinforced concrete footings bearing on 40-tsf bedrock.

Slab-on-Grade

The slab-on-grade at Level B-6 is 6" concrete.

Superstructure

The B-1 to B-6 levels have concrete encased steel wide-flange columns with steel shear heads. Loading dock area ceiling is composite steel wide-flange girders and beams supporting concrete slabs.

The second loading dock area is the former PATH station and is constructed with concrete encased steel columns, and girders and beams supporting a concrete (or masonry) arch ceiling. The floor structure is above the former power generating station. The structure construction was concealed.

Floors

Floors are typically 11" thick reinforced concrete flat slabs spanning between columns with drop panels at column shear heads.

Ramp Configuration

Ramps within the B-1 to B-4 levels for vehicle use are reinforced concrete slabs supported by steel columns, girders and beams. Structural steel at ramps typically has spray-on fireproofing.

Design Loads

SII Report 1 indicates the vehicular parking areas are designed for 50 psf live loads, and 75 psf to 300 psf at other areas plus diaphragm forces (slurry wall). Mechanical equipment and Central Plant design live loads were not furnished.

Condition

The concrete slabs at the main truck loading level are displaying deterioration from chronic chloride exposure from snow melting chemicals. The parking areas at the north and south of Level B-2, the south section of B-3, all of B-4 parking level, and the south ramp down from B-2 have significant spalling slab problems and a replacement program is anticipated to be necessary. B-3 north slabs were recently replaced.

The slurry wall has seepage that is contained by curbing and leaders, and disposed of to sump pumps in the lowest levels. The slurry wall and the adjacent floor slabs that brace the wall, should be inspected every few years to insure that unsafe conditions do not develop. The SII Report 38 (Data Room List), dated April 3, 1998, found the conditions to be acceptable.

Where they could be seen, aside from the slab deficiencies, the building's structural elements appear to be free from distress, settlement, and overloading. However, fireproofing of beams and girders was damaged or missing in significant areas of the truck loading docks and drive aisles. A column by the ramp up to Level B-2 was missing fireproofing.

The structural damage caused by the bomb blast in February, 1993 has been repaired under the supervision of The Port Authority and signed off by the Port Authority Engineering Department with A Certificate to Reoccupy (Attachment 3).

2. Exterior

This section of the complex is entirely below grade.

3. Roof

Roof Area

There is no conventional roofing over this section of the complex. The Plaza deck is discussed in the site section of Report 3.

4. Interior Construction and Finishes

Loading docks

There is the main loading dock facility at the base of the ramp from Barclay Street, at Level B-1. This facility provides service for the two Towers, the Marriott Hotel, and the U.S. Customs building. The U.S. Customs building leases its own assigned loading docks that are excluded from the Subgrade.

The concrete slabs at the loading dock drive aisles and truck berths are in the process of being replaced (multi-year plan). There are approximately 25 truck berths. None have load levelers. There are height restrictions in the loading areas that prevent the accommodation of 12' 6" high trucks. There are numerous compactors and dumpsters occupying truck stalls.

The second loading dock serves Buildings 4, 5, and the Concourse facilities, and is located in the site of the former PATH railroad station located under the east side of the site along Church Street, well beyond the slurry wall excavation. This loading dock is accessed from the Barclay Street entrance and uses a ramp down that connects to the former railway tunnel (tube). Truck egress from this loading area is by the 2nd tube that leads from the truck dock and now connects to Level B-1 in the Subgrade and exits through Barclay Street. This means of egress is temporarily unused during the slab replacement in the main loading dock area.

The second dock has facilities for approximately 20 trucks. There are adjacent freight elevators providing access to Buildings 4 and 5, and the Concourse.

Garages

The garages start at Level B-2, and have entry from the north on Barclay Street and entry on the south from Liberty Street. There is an entry ramp and exit ramp in the north section of the B-2 parking level and an entry ramp and exit ramp in the south section. Both sets of ramps are located on the west perimeter and run under the north traffic lanes of West Street and surface at the median in West Street.

The north and south Level B-2 parking areas are connected by a low headroom drive with adjacent low headroom parking facilities, which are below the depressed truck drive lane in Level B-1. Levels B-3 and B-4 north and south parking areas are separated and entered by separate ramps down from Level B-2. A section of Level B-3 north is fenced off for parking by the Secret Service.

The garage's columns and walls are color coded into 6 colors for the north and south sections on the 3 levels. Walls are painted. Ceilings are typically unpainted concrete surfaces. Floors are coal tar epoxy surfaced, except for B-3 north, which is a new "silica fume" slab. Exposed slurry walls are unpainted.

Tenant Space

The B-1 area under the Marriott Hotel, which was formerly used for Marriott Hotel parking is built-out for construction contractors working exclusively for the World Trade Center (not tenants).

There is a garage management office on Level B-2 with reception area, offices and toilet room facilities.

Storage

Excluding the Central Plant, Subgrade Levels B-5 and B-6 are primarily utilized for fenced storage. These areas are unfinished painted spaces.

Exits

There are numerous stair exits throughout the garage leading to the Concourse Level or to the exterior streets. Stairs are block enclosed, with steel stringer and concrete filled steel pans. Surfaces are painted.

There is entrance/exit (ADA accessible) to the PATH Concourse at Level B-4 adjacent to the elevators down from Tower 1.

Doors

Incidental service doors and stairway doors are painted steel in steel frames.

Other

The Subgrade spaces are ventilated through block enclosed continuous plenums along the south, west, and north slurry walls on the B-2 to B-4 levels. These plenums connect to 2 large projections on the west wall, one for the north garage area and one for the south garage area. These projections extend underground out to the median in West Street, and discharge the garage ventilation. They are formed by the slurry wall and reinforced concrete framing and slabs. They are raw unfinished space.

Aside from housing mechanical ventilation equipment and other mechanical equipment, the projections have stairs that serve as emergency access and egress to the PATH train tracks.

Condition

Subgrade garage areas are finished in good condition, except that the slabs require repair of spalled concrete (see Structural).

The utility and storage areas on the Levels B-5 and B-6 have original finishes and should be cleaned and painted.

A significant portion of the floor area falls beyond maximum permissible travel distances to an exit stair. In addition egress stairs must have properly sized or ventilated vestibules. Three-hour fire rating requirements between truck dock and adjacent areas need to be reestablished. These conditions have been noted by the PA and planning for the corrective measures are scheduled in the near future. Stair exits are in poor condition and should be cleaned and painted. Door hardware should be repaired as required

The projection spaces are very grimy and should be cleaned (but not painted).

5. Vertical Transportation

Overview

The elevators that serve the B-1 to B-6 Subgrade spaces are included within the other sections of the report. The elevators serving the Plaza Building truck dock are included with Buildings 4 and 5, or with the Concourse. There is 1 elevator (K-2) within the refrigeration equipment room to move Central Plant equipment delivered through the PATH tracks on Level B-5, or from the main loading dock area. Maintenance of this elevator is Central Plant responsibility. Large pieces of equipment for the Central Plant are delivered by contractor supplied rigging. In summary approximately 33 different elevators can be used to gain access to the Subgrade throughout the facility. Tenant parking areas are accessed by the 3 "J "cars in the vestibule of Tower 1 and the 3 "K" cars in the vestibule of Tower 2.

6. HVAC

Overall Systems

The majority of the Subgrade spaces are heated and ventilated but not air-conditioned. These include those areas occupied by Central Plant equipment, used for storage and used for parking or loading. Generally, outdoor air taken in from the two towers is routed to the mechanical rooms at the B-6 level of each tower. Equipment located in these mechanical rooms is dedicated to serve the Subgrade spaces (and included in this section of the report). The design philosophy is that tempered air is distributed to storage areas on the B-5 and B-6 levels, and then transferred to the parking and loading areas on Levels B-1 to B-4. The parking and

loading dock areas are exhausted through perimeter plenum/wind tunnel spaces that exhaust through the north and south projections in West Street. The Subgrade areas typically operate at a negative pressure, which facilitates air supply, and helps to control infiltration into the building spaces. Areas used for offices are typically provided with air conditioning, and equipment located in the Subgrade areas supplies HVAC to the PATH train areas as well. The chillers and other equipment, which are located in the Subgrade space, are described in a separate report.

Heat

Medium pressure steam, supplied from the Central Plant, goes through pressure reducing stations located in the B-6 level mechanical equipment rooms (MERs). The low-pressure steam is piped to coils in AHUs, which supply ventilation air.

Additional heat is supplied by steam unit heaters located in mechanical spaces within the footprint of the Towers.

Heat Exchangers

Heat exchangers within the Subgrade space are considered to be part of the Central Plant equipment, and are described in a separate report.

Air Conditioning

Chilled water from the Central Plant is supplied to chilled water coils in 17 of the air handling units which serve fully air conditioned Subgrade areas. Included in this total are 3 units which serve PATH areas. Ten of the AHUs are located within the Tower 1 footprint and 7 are located within Tower 2 footprint.

Certain areas such as the car pool office, and contractor offices have window style air conditioning units installed.

A looped condenser water system is available for tenants' supplementary water-cooled air conditioning units.

Pumps

One 75-hp. chilled water pump (CWC-1)

Three duplex steam condensate pumps with receivers associated with the air-handling unit steam coils that serve the Subgrade spaces. These are located within the Towers.

The various pumps associated with the Central Plant, which are located in the Subgrade space, are described in a separate report.

Air Handling Units

Twenty-two central AHUs, located in the B-6 level of 1 WTC rated from 13,000 to 133,000 cfm with 10 hp to 100 hp motors, supply conditioned air to designated Subgrade areas. Eight of the units include cooling coils, and all include heating coils.

Twelve central AHUs, located in other Subgrade areas of the complex rated from 2,500 to 45,000 cfm with 1 hp to 40 hp motors, supply conditioned air to designated area. Two of the units include cooling coils, and all include heating coils.

Thirteen central AHUs, located in the B-6 level of 2 WTC rated from 6,000 to 72,000 cfm with 5 hp to 50 hp motors, supply conditioned air to designated Subgrade areas. Seven of the units include cooling coils, and all include heating coils.

Fans

Toilet, AHU return air, parking area transfer, and mechanical room exhaust fans are installed.

Condition

The mechanical systems are adequately designed, using brand name equipment, which provides adequate cooling for the designated office areas. The equipment has been maintained in operating condition, but most equipment is original (30 years old), and has or will exceed its published service life over the next 5 years, and replacement should be anticipated. A capital program to upgrade the HVAC air handling systems has been implemented.

It is recommended that carbon monoxide sensing equipment be located throughout the parking areas and loading dock in order to safeguard personnel who work in these areas for extended periods of time. A need has been identified for an upgrade to the truck dock area exhaust and ventilation capacity. Planning for the project is scheduled in the near future.

7. Plumbing

Storm and Sanitary Systems

Sanitary waste flow to municipal sewers in the streets that flow to NYC waste treatment plants. Storm water is disposed of to municipal sewers in the street, and to sewers leading to the harbor.

Water Service

The two metered 12" main water services at the north and south ends of the complex are cross connected through the Subgrade pipe tunnel at the B-1 level. There are also two smaller services, a 1" service which reportedly serves a water-cooled condenser for the Windows on the World Wine

Cellar, and a service at the remote River Water pump station in Battery Park City. A 4" service located along West Street within the slurry wall enclosure at Level B-2 is used for the Hotel. Domestic water used in the Subgrade areas is typically fed from the Tower buildings.

Water Pipe Material — Copper

Domestic Water Heaters — Either supplied from the towers or provided by a point of use electric water heater.

Pumps — Six 20-hp, 350 gpm Sewage ejector pumps

Five 20-hp, 350 gpm Sump pumps

Toilet Rooms — There are toilet facilities within the parking garage office and the car pool office. Other occupied areas use the facilities within the footprint of the towers.

Condition — The plumbing systems appear to be in generally good condition, and are reportedly functioning satisfactorily. Although in operation, replacement of pumps, and water heaters should be anticipated over the next 10 years. Equipment or component maintenance is performed as part of the ABM service contract. The replacement of a sump pump was observed to be in progress in one area.

8. Electrical

Main Service — The Central Plant Primary Distribution Center (PDC) on the B-3 level of the Subgrade supplies 13.8 kV primary electrical service to the 26 electrical substations and 2 refrigeration plants located throughout the complex. High voltage concrete encased duct banks are labeled and safety colored purple for easy identification and run throughout the Subgrade areas to distribute primary power. Separate electrical switchgear for the mechanical plants is located within the Subgrade areas, as are the emergency generators and the tertiary feed from the PATH trains.

Power and lighting for the Subgrade originates from step-down transformers and distribution switchgear within the associated substations that are part of the Central Plant.

Capacity — Power is taken from the substations as needed to supply the Subgrade areas, as well as the Central Plant equipment.

Wiring — Copper and aluminum observed.

Emergency Power	Six generators, located in the Central Plant, supply emergency power for lighting, elevators, and the life safety system. Certain select feeders, which are backed up by a tertiary power substation fed from the PATH are used for additional backup of life safety systems as well.
Lighting	Recessed, surface- and wall-mounted, and suspended fluorescent fixtures, and other incandescent fixtures provide interior lighting.
Other	Telephone/communication risers originate in the Subgrade, and service providers have equipment located in the Subgrade spaces. Two main points of entry for Telcom are in the projections at Level B-2. A CCTV system is installed, as well as an emergency call system. There is a parking access control system installed which monitors the arrival and departure of tenant cars parked in the facility, as well as monitoring the location of the car within the parking structure.
Condition	The electrical systems are reportedly functioning satisfactorily.

9. Life Safety

Sprinklers	The parking and loading areas are completely sprinklered, as are the storage and office areas. Mechanical and electrical areas are typically not sprinklered.
Fire Standpipe	Fire standpipe risers were observed throughout the Subgrade. Zone coverage maps indicate that coverage is provided throughout.
Fire Pumps	The fire pumps are associated with the buildings and the Mall, and are described in those sections.
Tanks	Diesel oil tanks associated with the Central Plant emergency generators are part of another report.
Fire Alarm System	A Siemens Cerberus Pyrotronics fire alarm system is installed with control and annunciator panels, manual pull stations, alarms, audio/visual alarms, strobe lights, flow and tamper switches, fire warden telephones, and smoke detectors.

Fire Extinguishers — Fire extinguisher cabinets are located throughout the Subgrade. Also 150 lb. dry chemical extinguishers are located in all parking areas.

Emergency Lighting — Fluorescent fixtures, with battery back-up are located in the stairs. Selected fixtures are connected to emergency circuits.

Exit Lighting — Illuminated exit signs are provided which are connected to emergency circuits.

GFIs — Installed in some toilet rooms.

Condition — The life safety systems are typical for a supporting substructure garage, Central Plant and storage area. A new fire alarm system is currently being installed. Some of the sprinkler heads observed in the loading dock area were painted or covered with spray fireproofing. These should be surveyed and replaced as needed.

10. Energy Conservation

General — The Subgrade is largely below grade. The entrance ramps can be closed with overhead gates, but typically allow air into the areas which require ventilation. Most of the lighting fixtures use energy saving fluorescent lamps and electronic ballasts.

Energy Management — The Subgrade does not have an energy management system.

11. ADA Compliance

Overview — For the purpose of this report, a general review of the property has been conducted to determine basic compliance with Title III of the federally-enacted ADA, dated July 26, 1990. Under the ADA, buildings initially occupied after January 26, 1993 (or building areas altered after January 26, 1992), are required to comply with ADAAG. Projects, with areas of public accommodation, constructed prior to this date are required to comply forthwith, to the extent it is "readily achievable." Provisions in the Act require Owners of existing properties with public accommodations to identify barriers for physically disabled persons that exist on the site or in buildings. The barriers should be systematically removed according to a given set of priorities, the degree allowed by structural feasibility, and the financial resources available. The obligation to remove barriers is a continuing one.

The ADA sets forth "recommended priorities for public accommodations" to be accessible to the disabled. In general, the three priorities are as follows:

1. Access from public sidewalks, parking, or public transportation to a building entrance,
2. Access to any areas of goods and services that are made available to the public; and,
3. Access to rest room facilities.

During our tour of the project, we noted the following

The parking garage areas have ramps that allow wheelchair access to the elevators in each Tower. There are automatic elevator vestibule doors at the Yellow lot. The elevators are equipped for ADA compliance. There are parking stalls assigned for use to persons with disabilities. The toilet facilities in the garage office at the B-2 yellow level are ADA complying. There is an ADA access to the PATH Concourse at Level B-4 adjacent to the elevators from Tower 1.

12. Code Compliance

Applicable Code

1968 NYC Code as Administered by the Port Authority of New York and New Jersey

Building Construction Classification

Class1-B - noncombustible, fire-protected, sprinklered

Occupancy Type

Group B-1 - Truck loading facilities, storage areas
Group B-2 - Parking levels

Violations Record

As stated in the Offering Memorandum, "The Port Authority is a municipal corporate instrumentality and political subdivision of the States of New York and New Jersey which provides transportation, terminal, and other facilities of commerce within the Port District. As such, in connection with the transaction, the PA will continue to maintain exclusive jurisdiction with respect to certain administrative and governmental matters involving the Complex, including compliance with building, environmental, fire and health codes." The New York City Department of Buildings has indicated that they do not maintain any records of violations for this property. A request for a Property Profile Overview for this block and lot number yields no records. The Fire Department provides normal fire fighting and a life safety

service to the facility. A Memorandum of Understanding exists between the Port Authority and the Fire Department in which the Fire Department performs regular inspections and directly notifies the Port Authority Fire and Life Safety group of deficiencies to be corrected. Under a protocol with the New York City Fire Department, Port Authority Police personnel investigate certain fire alarms at the World Trade Center rather than transmitting such alarms to the New York City Fire Department.

Certificate of Occupancy

A Certificate of Occupancy has not been issued by the City of New York because property owned by the Port Authority is not subject to the Building Code of the City of New York. We have observed "Permits to Use or Occupy" issued by the Port Authority for specific work, notably the October 10, 1997, Permit issued following completion of repairs following the 1993 bombing, but the Port Authority did not routinely issue the equivalent of a base building Occupancy Certificate until January 1992. In addition, in December 1995, the Port Authority started an optional "Professional Self-Certification" program for alteration work by tenants. The PA has issued "Consent to Occupy" certificates for specific work under this program. The Permit to reoccupy the Subgrade after the bomb blast in 1993 is included as Attachment 3.

E. Recommendations

We have prepared a listing of items that will require action within the next 10-year period. Immediate expenditures indicate deficiencies which are in violation of codes, which pose a danger to public safety, or which, if left uncorrected, will lead to further deterioration of the property or significantly impact marketability or habitability. Recommended work, not required by agencies or codes, which, in our opinion, represents expenditures that should be made in the context of the prudent management of the property is also listed. These items should be undertaken on a priority basis. Items have been divided into 1- to 5-year and 6- to 10-year time frames.

	IMMEDIATE (0 - 1 YR.)	FUTURE (1 - 5 YRS.)	FUTURE (6- 10 YRS.)
General			
1. The net lessee must proceed installation of the new fire alarm system and phased implementation of Local Law 5 and 16 requirements. It is reported that the FDNY has approved this approach. The design of this component of the alarm system has not yet been done.	X	X	X
Structure			
2. The concrete drive aisle slabs at the main truck loading level are displaying age- and usage-related deterioration from chronic chloride attack from snow melting chemicals. A 2-year program of replacing the slabs has begun.	X	X	-
3. The parking areas at the north and south section of Level B-2 and south section of B-3, and all of B-4 parking level have significant spalling slab problems and a slab replacement program is anticipated to be necessary. The north section of B-3 has had the slab replaced.	X	X	-

	IMMEDIATE (0 - 1 YR.)	FUTURE (1 - 5 YRS.)	FUTURE (6- 10 YRS.)
4. The slurry wall has seepage that is contained by curbs and leaders, and disposed of to sump pumps in the lowest levels. The slurry wall and the adjacent floor slabs that brace the wall, should be inspected every few years to insure that unsafe conditions do not develop. The SII Report 38 (Data Room List), dated April 3, 1998, found the conditions to be acceptable.	-	X	X
5. Where they could be seen, the building's structural elements appear to be free from distress, settlement, and overloading. However, fireproofing of beams and girders was damaged, missing, or inadequate in significant areas of the truck loading docks and drive aisles. A column by the ramp up to Level B-2 was missing fireproofing.	X	-	-
Interiors			
6. The utility and storage areas on the Levels B-5 and B-6 have original very worn finishes and should be cleaned and painted.	X	X	-
7. A significant portion of the floor area falls beyond maximum permissible travel distances to an exit stair. In addition egress stairs must have properly sized or ventilated vestibules. Three-hour fire rating requirements between truck dock and adjacent areas need to be reestablished. These conditions have been noted by the PA and planning for the corrective measures are scheduled in the near future. Stair exits are maintained poorly and should be cleaned and painted. Door hardware should be repaired as required.	X	X	-

	IMMEDIATE (0 - 1 YR.)	FUTURE (1 - 5 YRS.)	FUTURE (6- 10 YRS.)
8. The projection spaces are very grimy and should be cleaned (but not painted).	X	X	-
HVAC			
9. Considering the age (29 years) of most of the mechanical equipment, ongoing phased replacement of components should be expected to continue over the next 10 years. This required maintenance is currently handled under the terms of the service contract with ABM.	-	X	X
10. It is recommended that carbon monoxide sensing equipment be located throughout the parking areas and loading dock in order to safeguard personnel who work in these areas for extended periods of time. A need has been identified for an upgrade to the truck dock area exhaust and ventilation capacity. Planning for the project is scheduled in the near future.	-X	X	-
Life Safety			
11. Survey and replace sprinkler heads in the loading dock area which have been covered with paint or spray fireproofing.	X	-	-

ADA

During our tour of the project, we noted the following areas that do not appear to meet the requirements of ADAAG and suggest that these features be added when feasible or when areas are renovated.

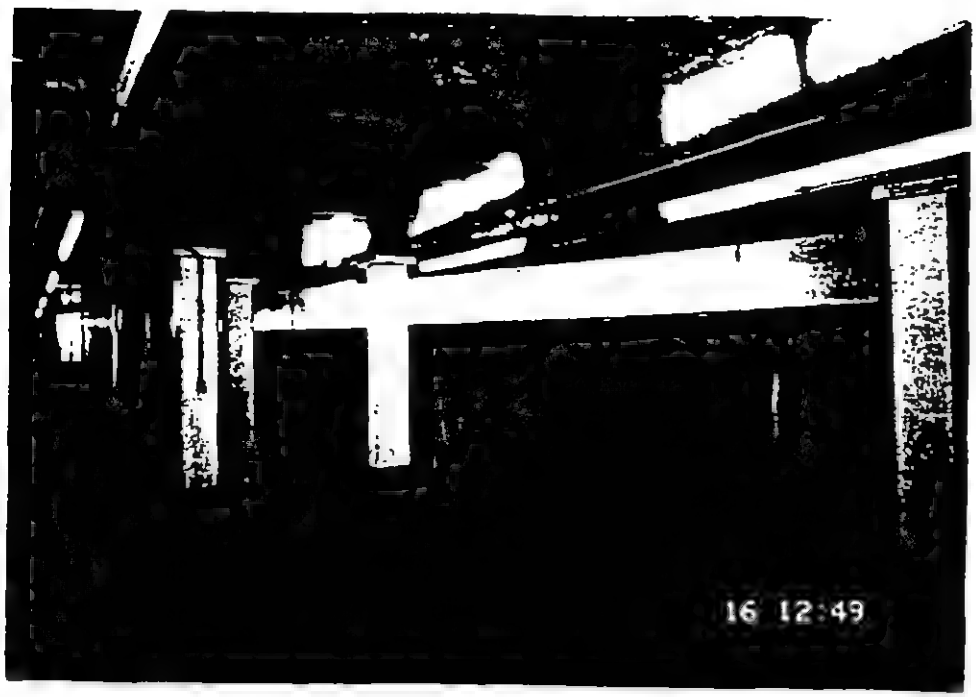
1. There are no significant items of non-compliance with ADAAG in the Subgrade.

F. Attachments

1. Photographs
2. Subgrade Plans (6 sheets)
3. Permit to Reoccupy
4. Crandlemere and Associates Asbestos-Containing Materials Document Review and Evaluation

ATTACHMENT 1

Photographs



Photograph 1

Slurry wall exposed in Level B5

Photograph 2

Base of slurry wall - Level B6

Photograph 3

Ceiling slab spalling at slurry wall

Photograph 4

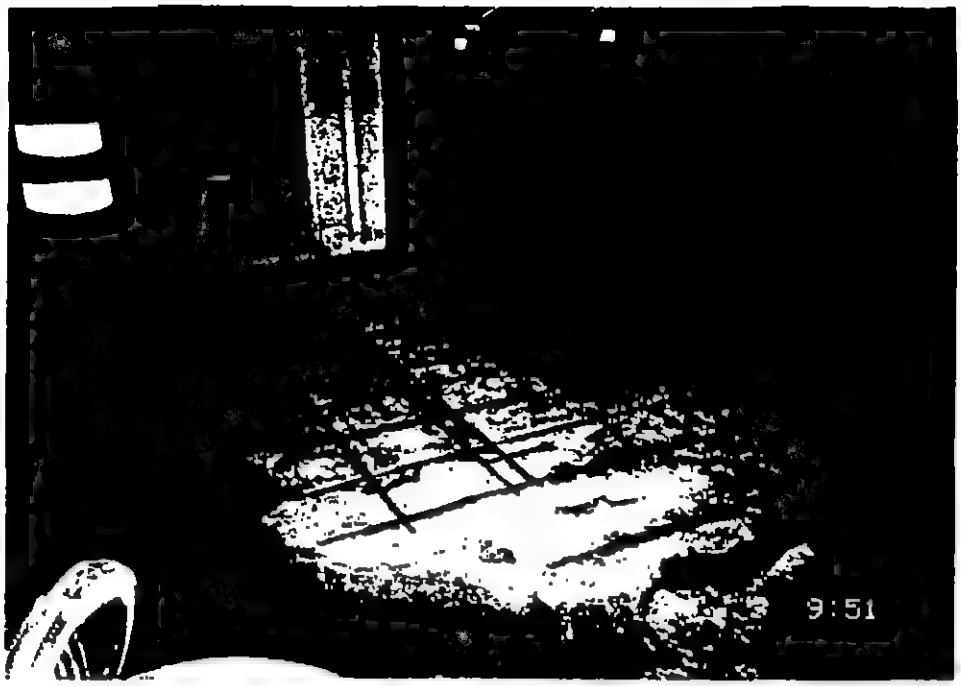
Ventilation plenum typical - runs along north, east, and south walls of garages at Levels B2 - B4

Photograph 5

Leakage stains on slurry walls

Photograph 6

Stains on slurry wall and patches for leaks

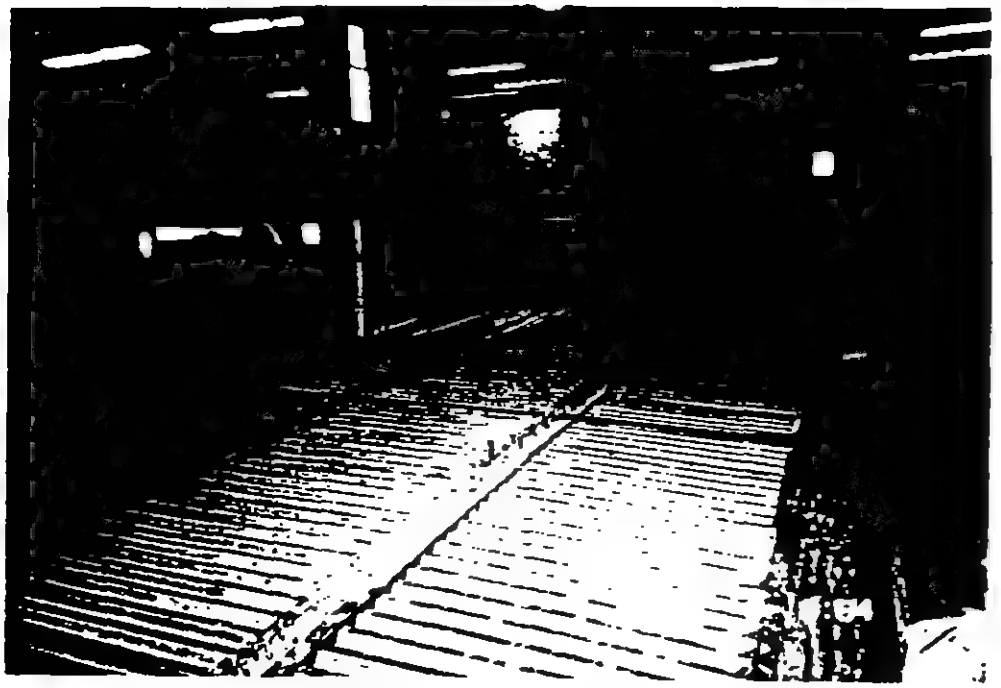


Photograph 7

Spalling garage slab - Level 2, North

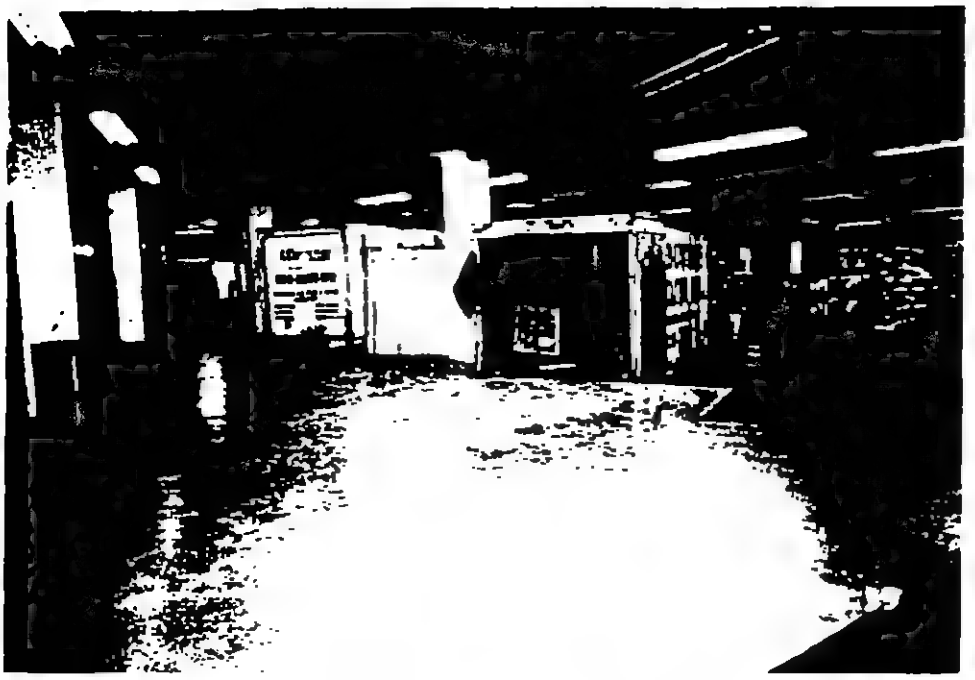
Photograph 8

Spalling slab in B5 Central Plant



Photograph 9

New slab being installed in loading dock area - start of multi-stage program

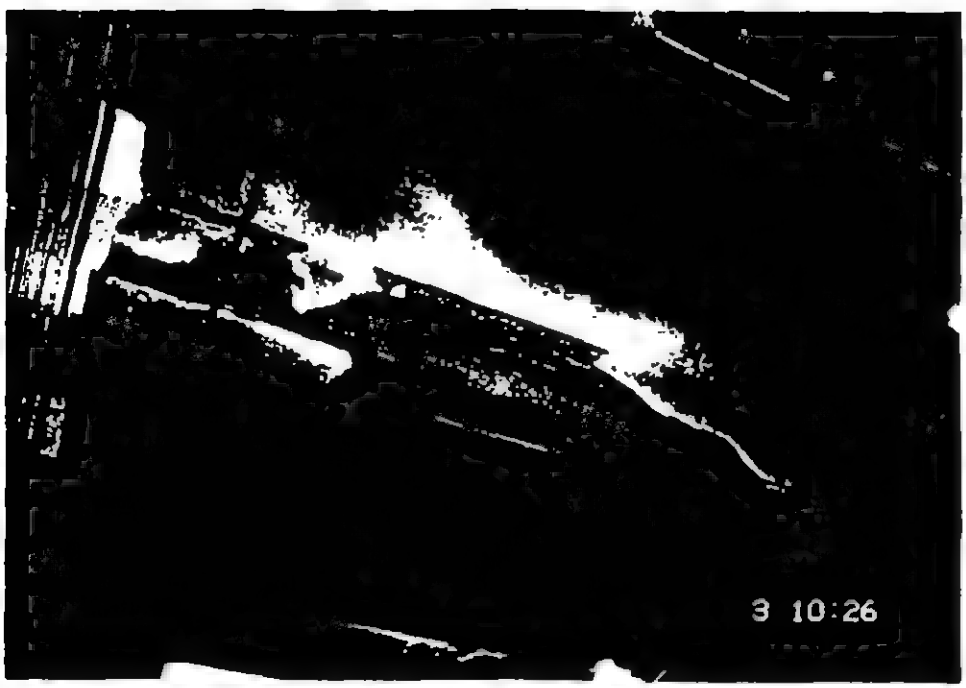


Photograph 10

Loading dock area

Photograph 11

Loading dock area for US Customs Buildings

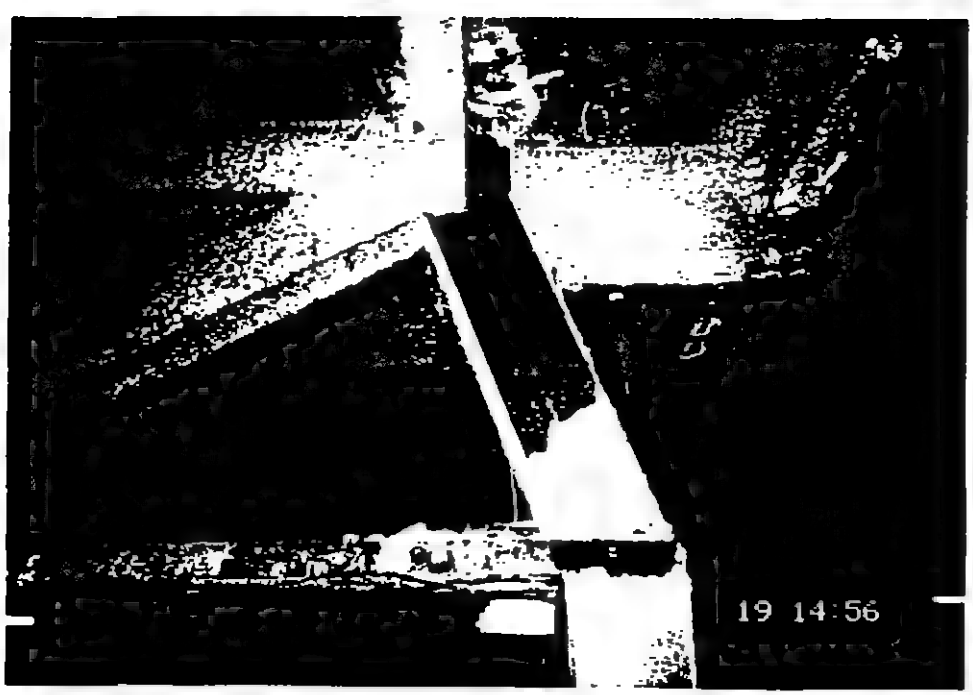


Photograph 12

Missing fireproofing at loading dock

Photograph 13

Missing fireproofing at ventilation plenum - B2 North



Photograph 14

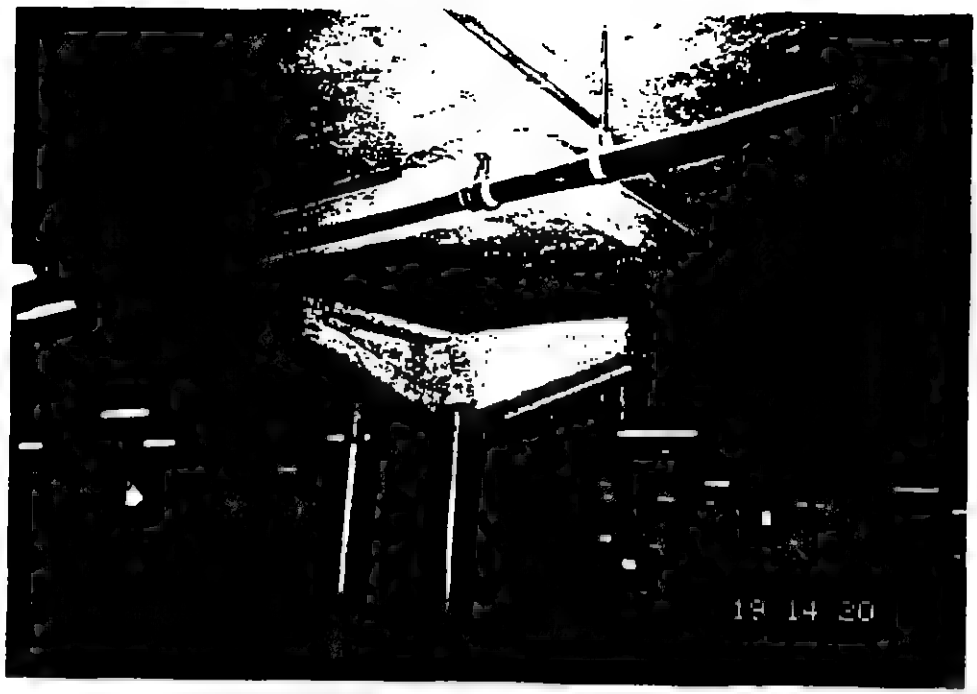
Missing fireproofing at B-2 Garage

Photograph 15

Leased offices at former parking area (B1) for Marriott Hotel

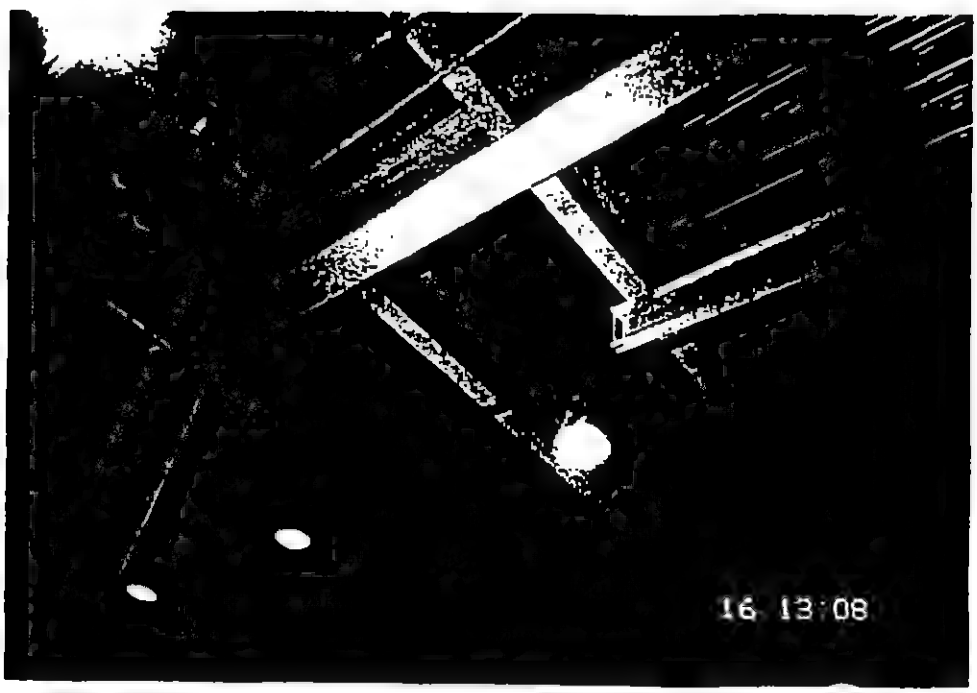
Photograph 16

Repairs of ceiling slab at B2 ceiling due to bomb explosion



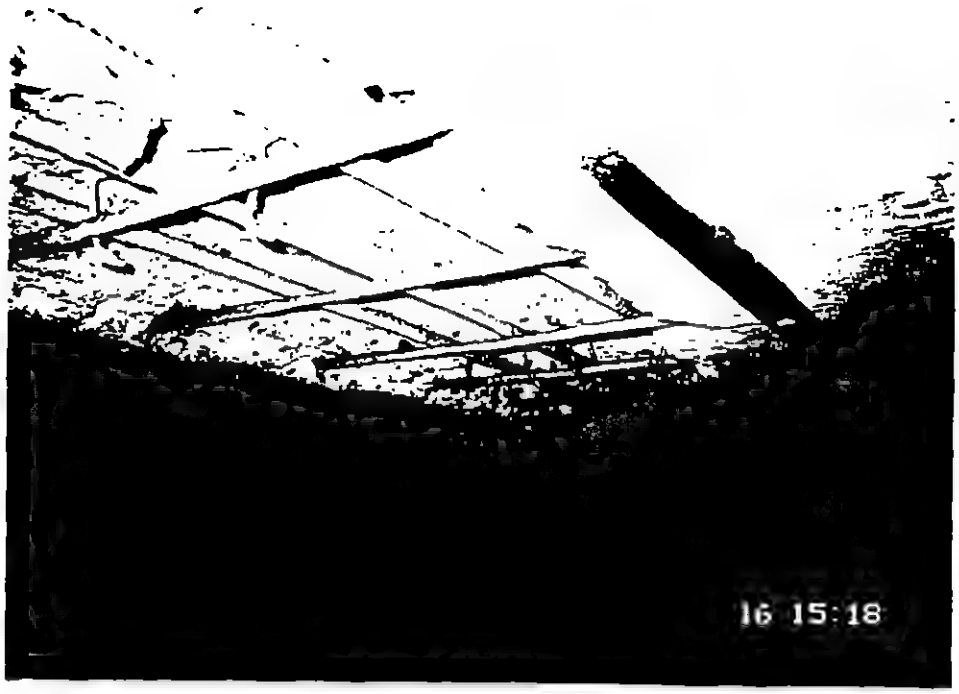
Photograph 17

Repairs at column brackets to support weakened slabs



Photograph 18

New ceiling slab installed above refrigeration plant due to bomb blast



Photograph 19

Ceiling under B4 ramp (south) in ventilation plenum requires repairs

Photograph 20

Level B2 slab spalling (at ramp)

Photograph 21

Stair in projection serves as PATH emergency exit

Photograph 22

Typical subgrade stair requires cleaning and some require painting

Photograph 23

B5 and B6 storage spaces

Photograph 24

B4 northeast stair door being replaced

Photograph M1

Heating and ventilating unit in the loading dock area

Photograph M2

Window style air conditioning unit used in the parking office

Photograph M3

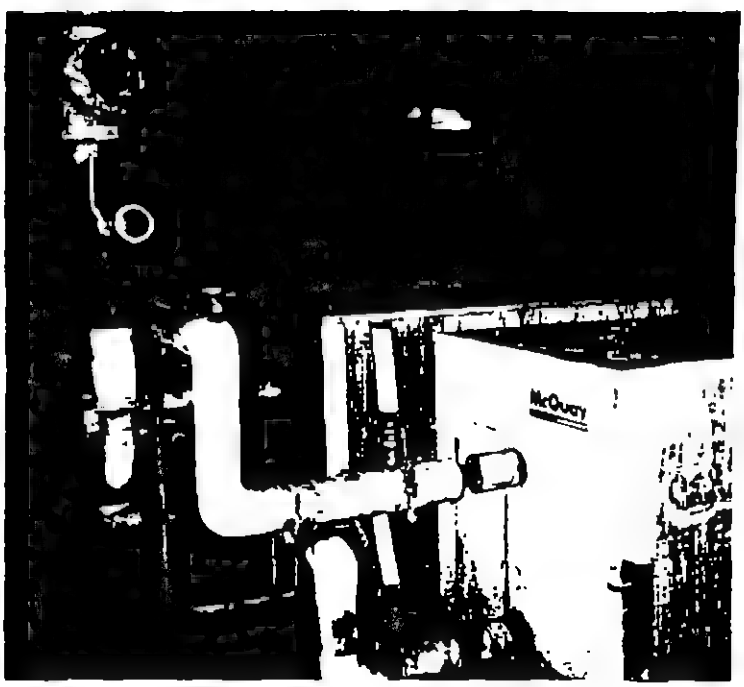
Exhaust fan for the loading dock area

Photograph M4

Parking level exhaust plenum space

Photograph M5

Typical subgrade exhaust fan

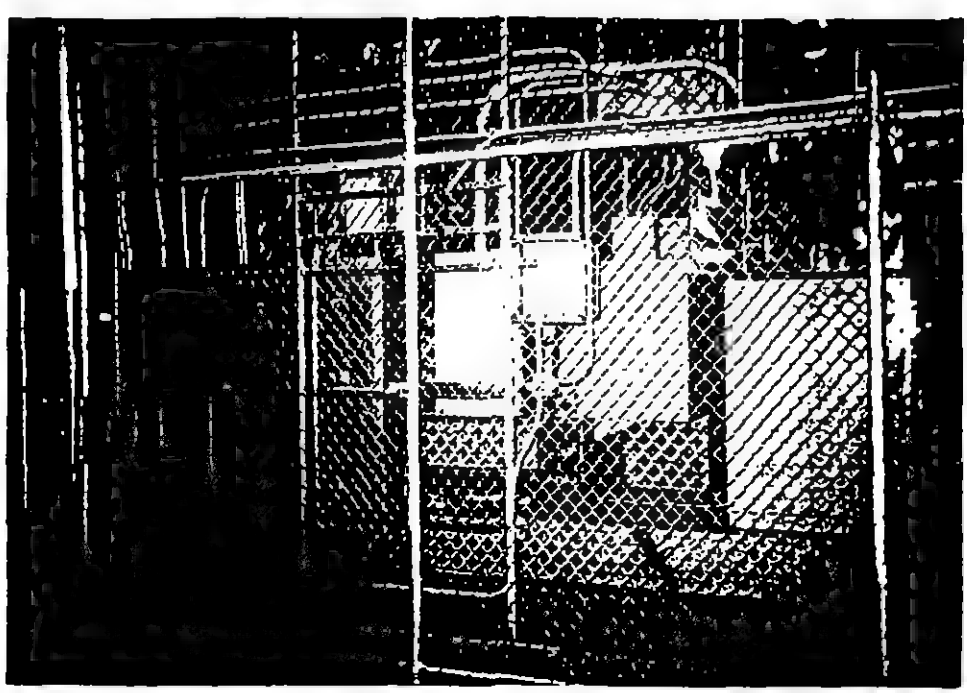


Photograph M6

Subgrade mechanical space with tenant air conditioning equipment

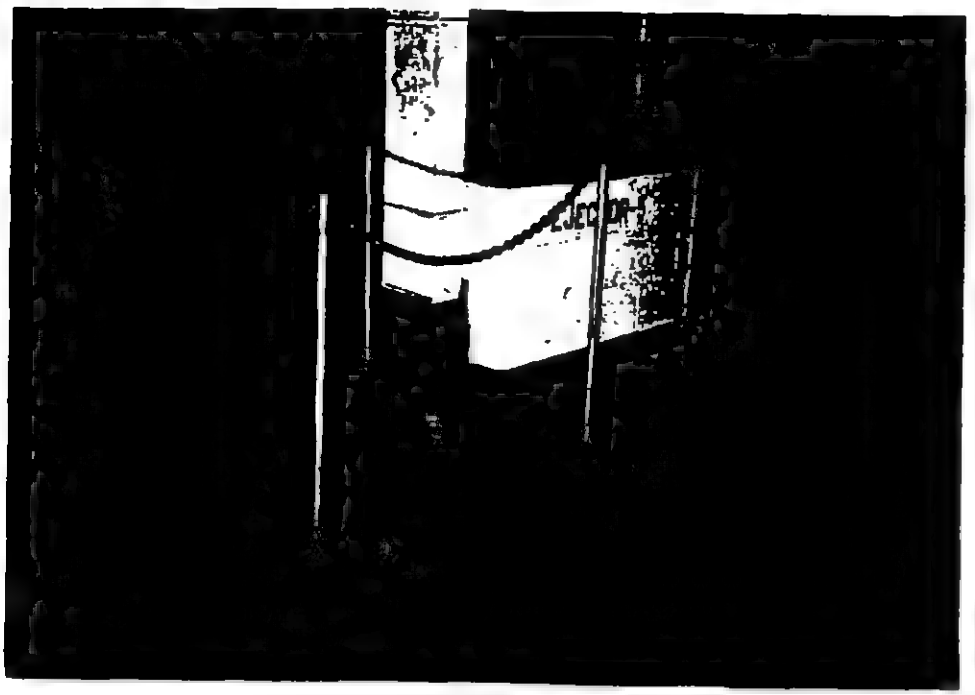
Photograph M7

Tenant air-cooled condensers in the northwest projection area



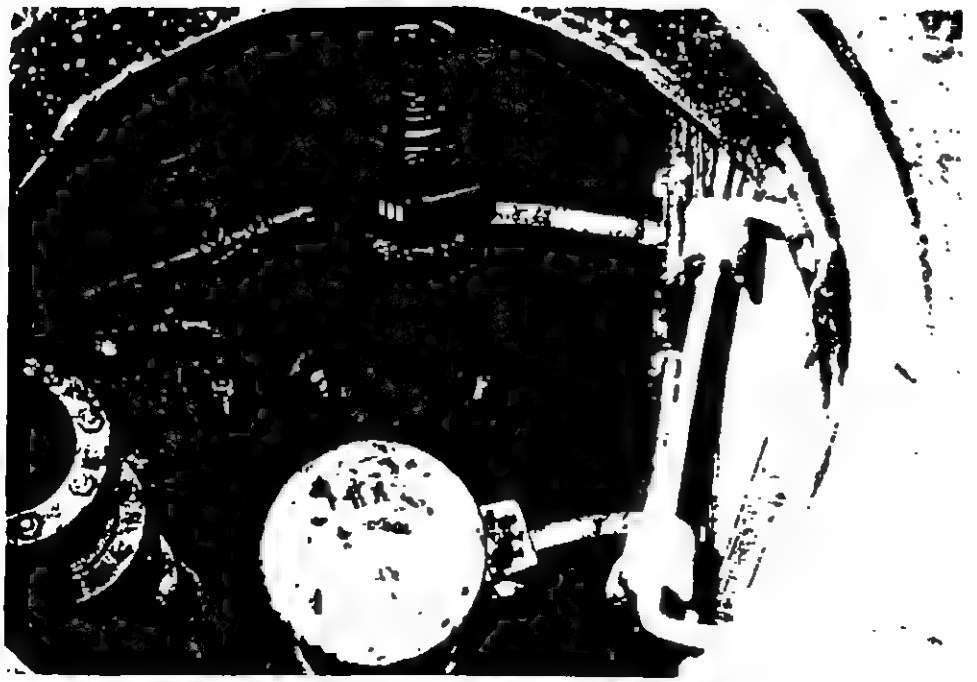
Photograph M8

Tenant emergency generator in the northwest projection area



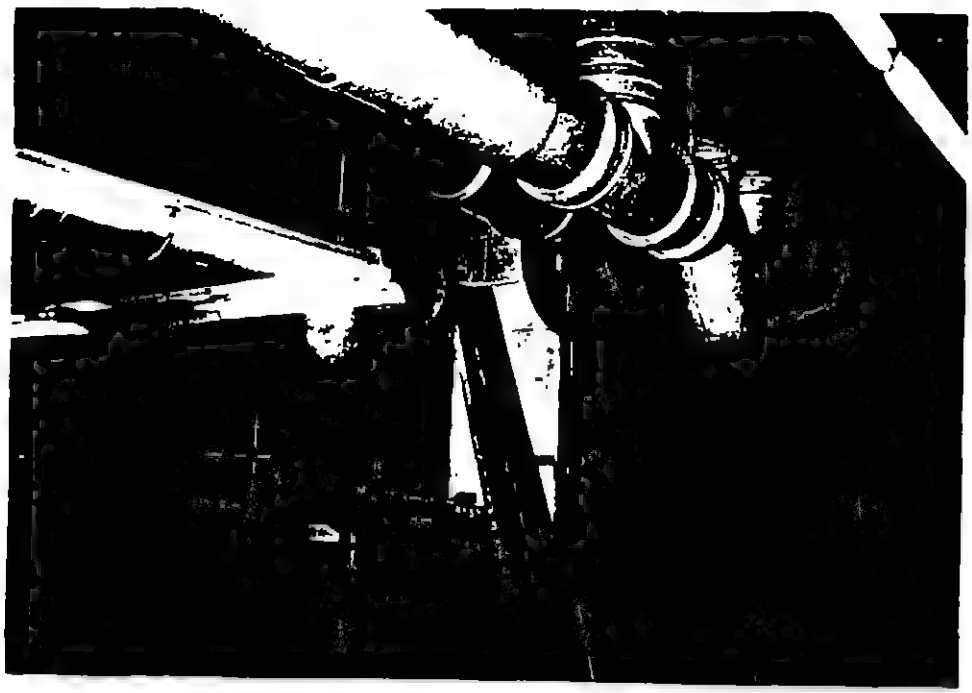
Photograph M9

Typical sewage ejector pit



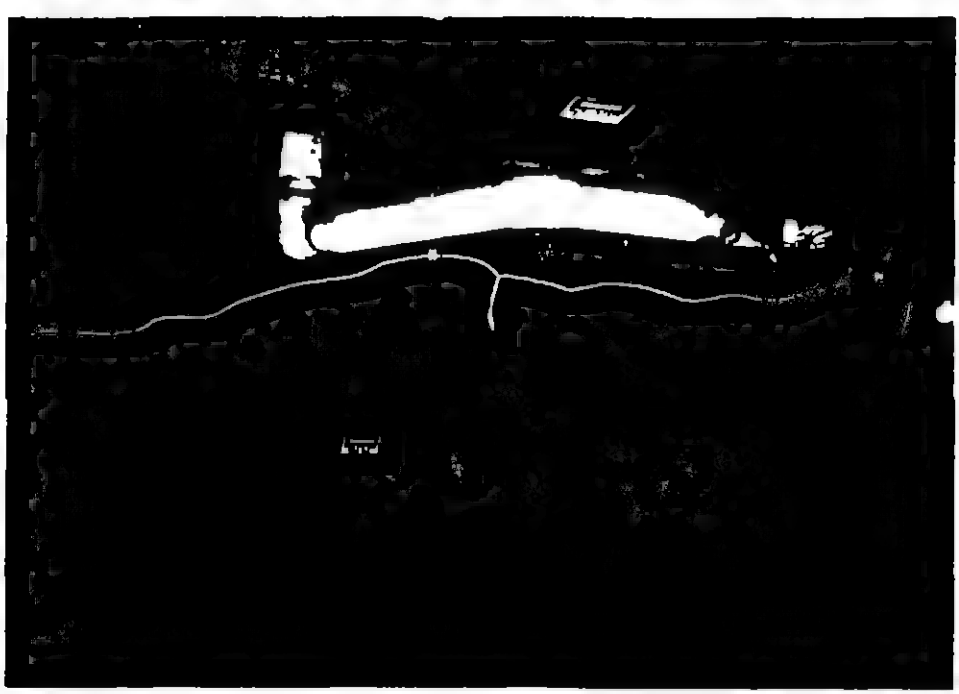
Photograph M10

Pumps within an ejector pit



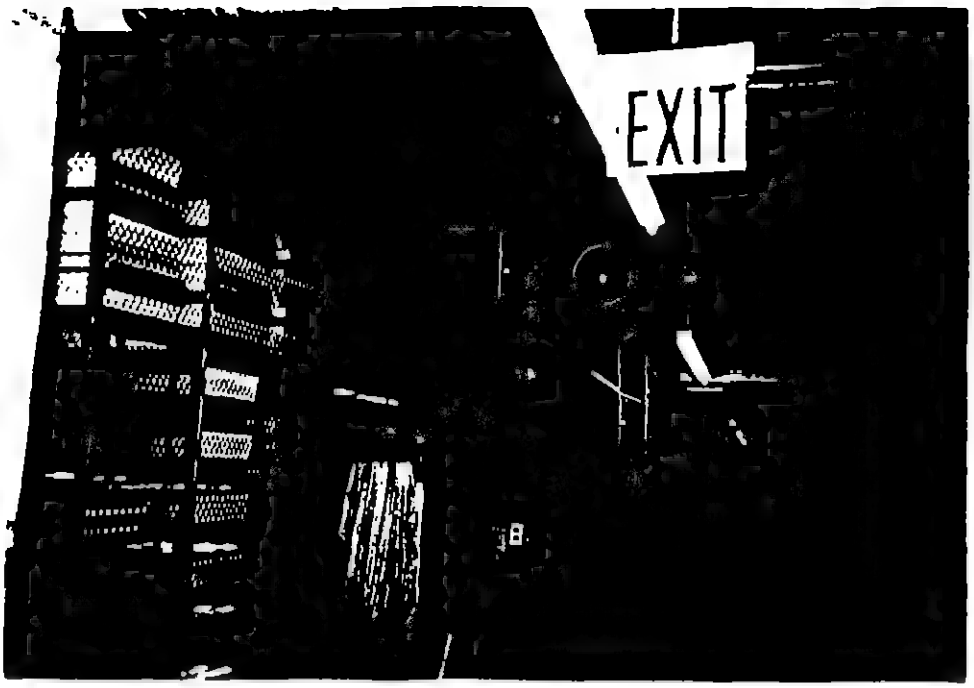
Photograph M11

House traps within subgrade space



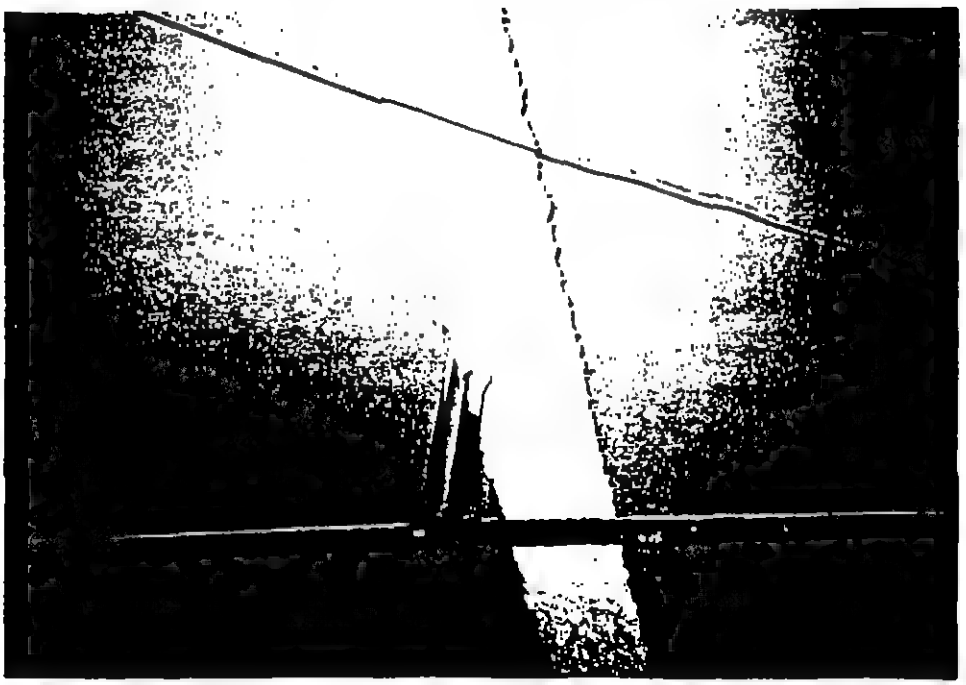
Photograph M12

High voltage electrical duct banks painted purple within the subgrade space



Photograph M13

Life safety devices within a subgrade storage area



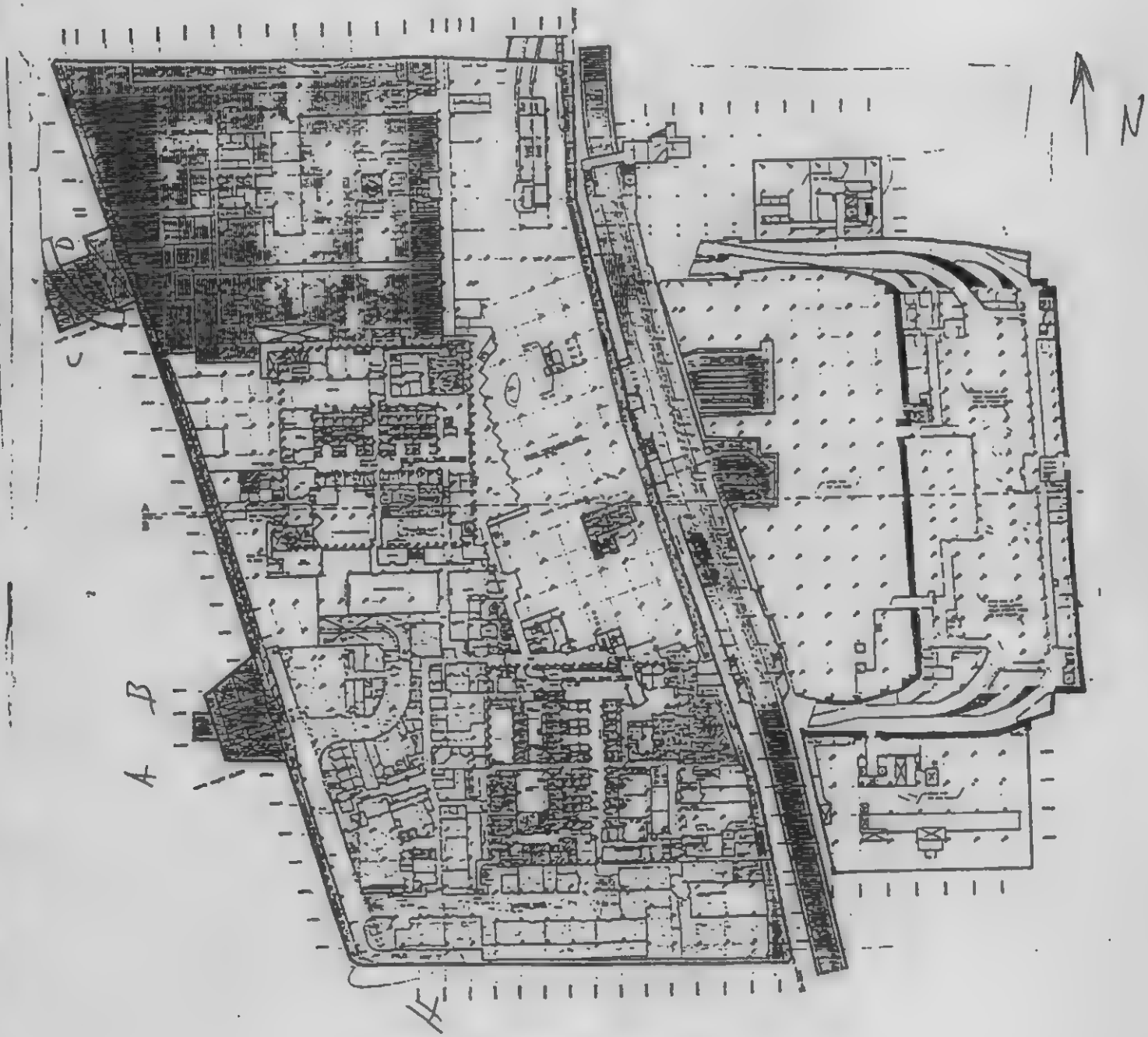
Photograph M14

Sprinkler head in the loading dock area observed to be painted

ATTACHMENT 2

Subgrade plans

4. KEY PLAN OF INSPECTED LOCATIONS



WORLD TRADE CENTER

B-1 LEVEL

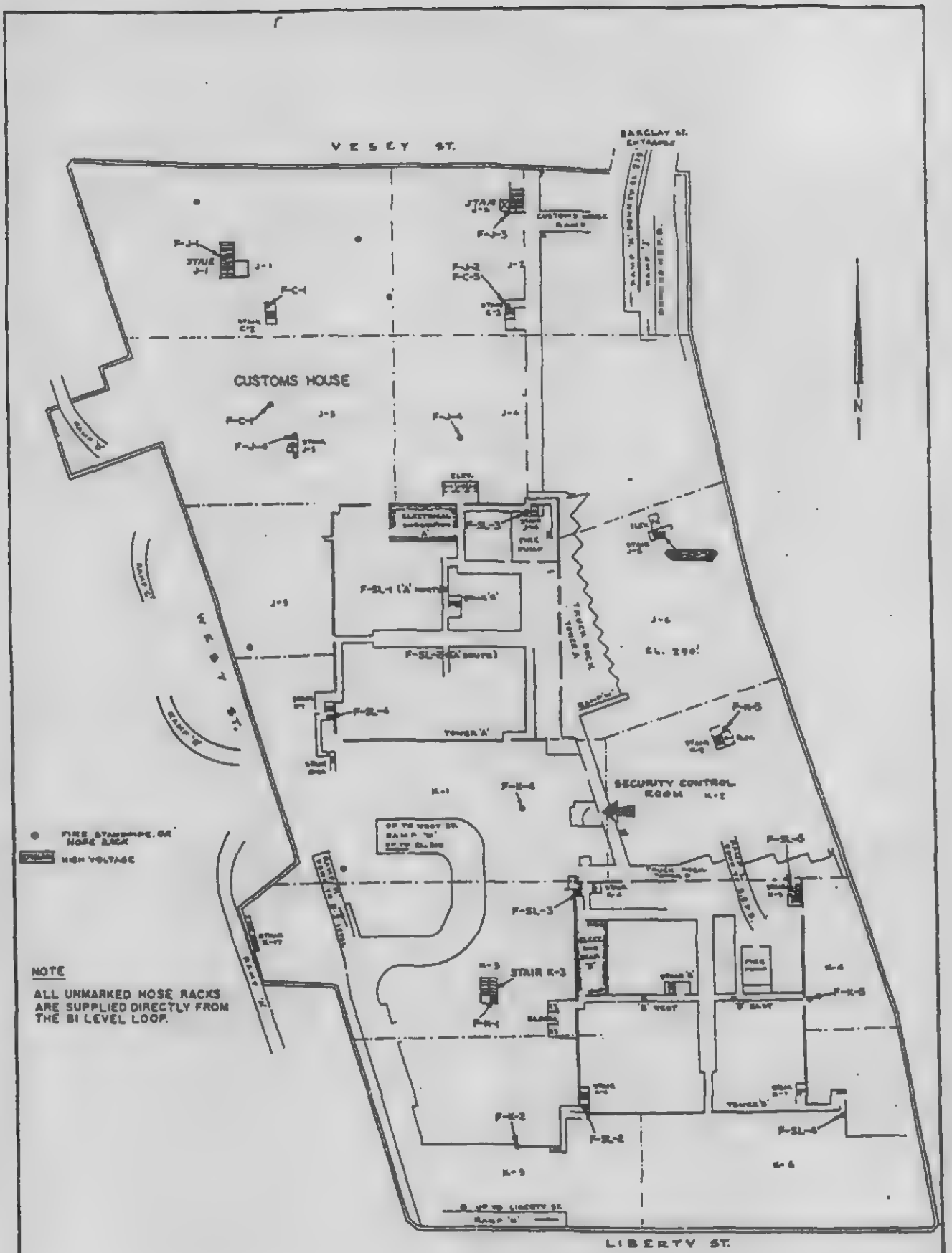


Figure 10.20 Plan -Level B1

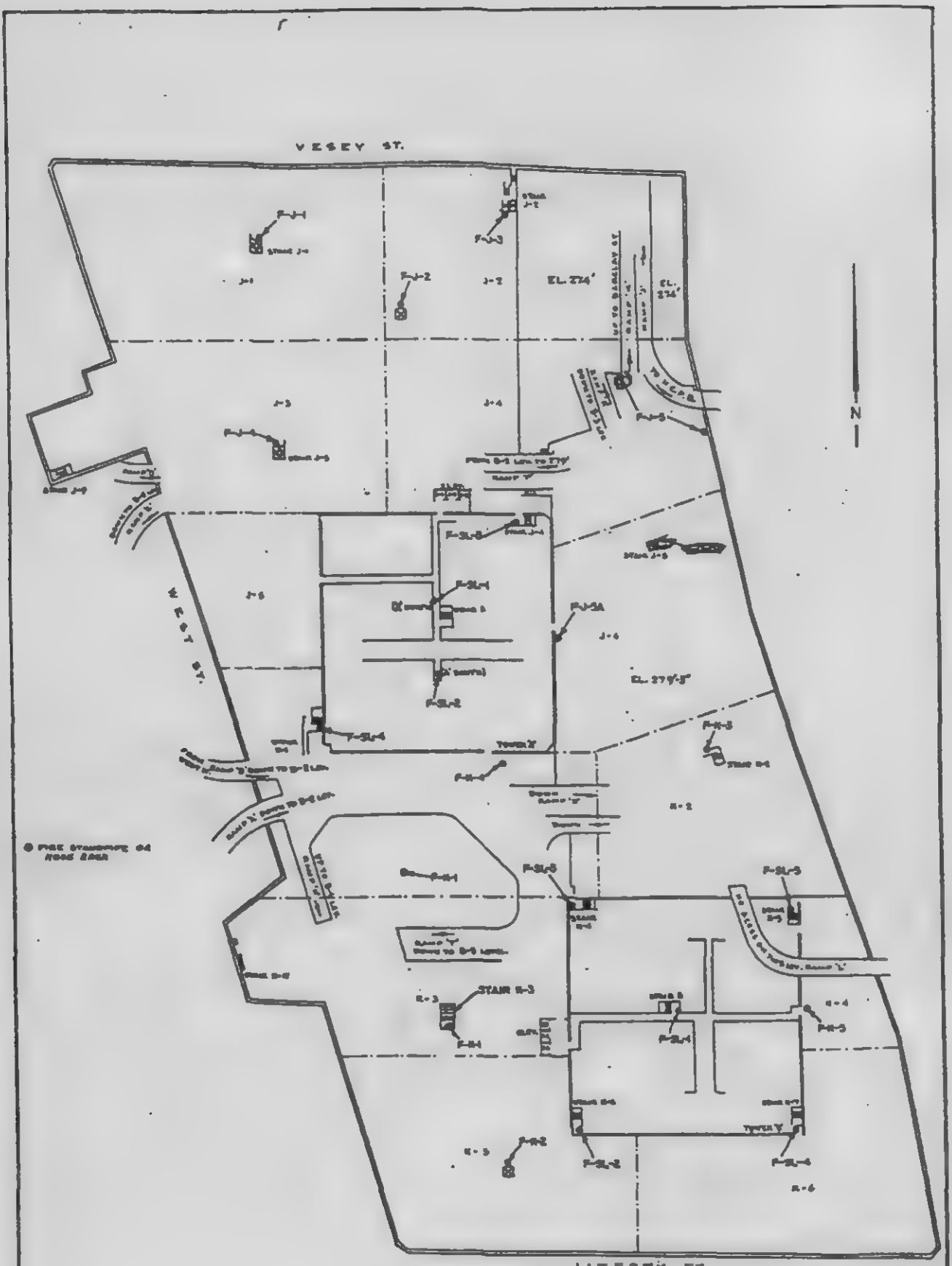


Figure 10.21 Plan

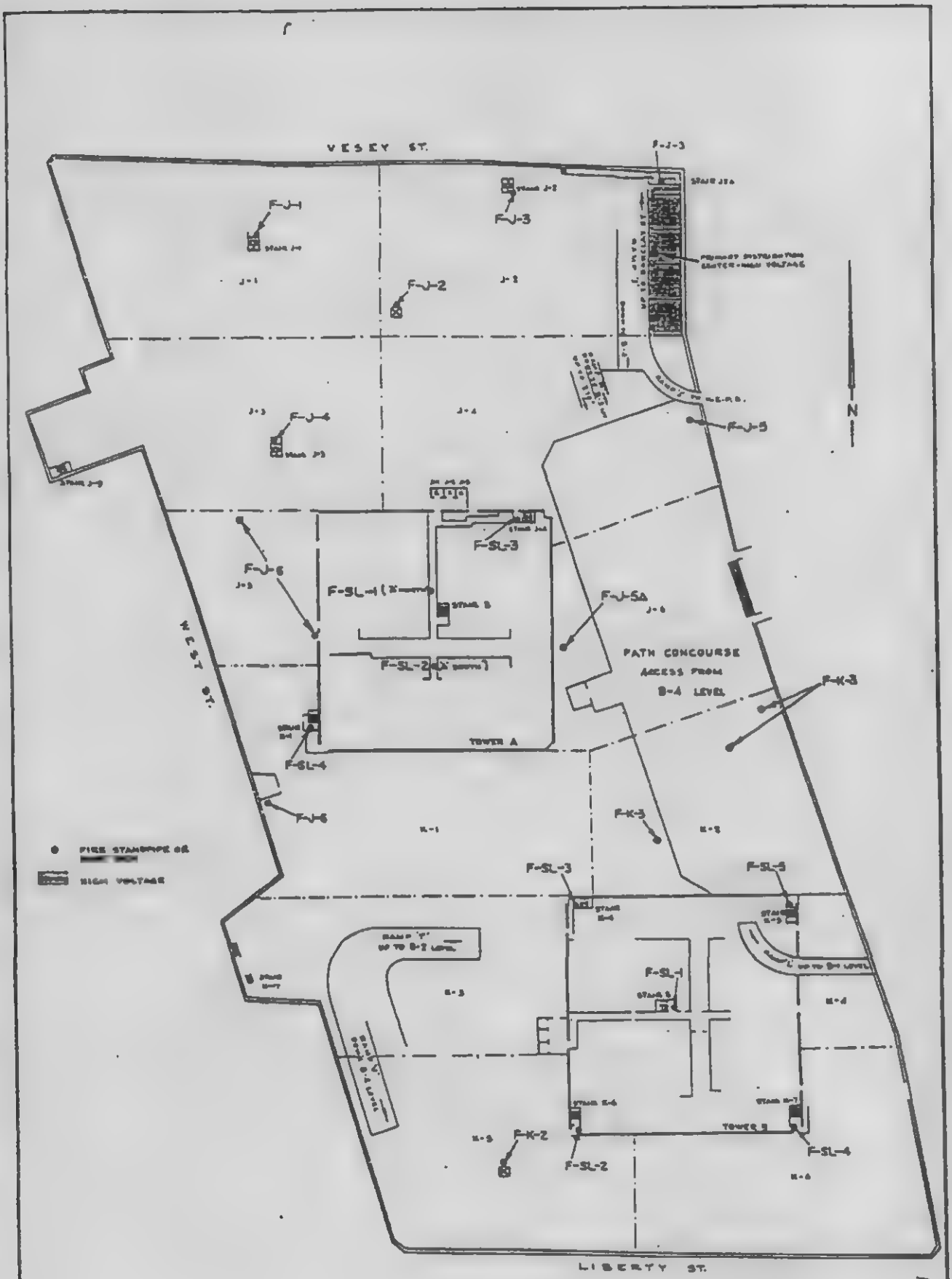


Figure 10.22 Plan

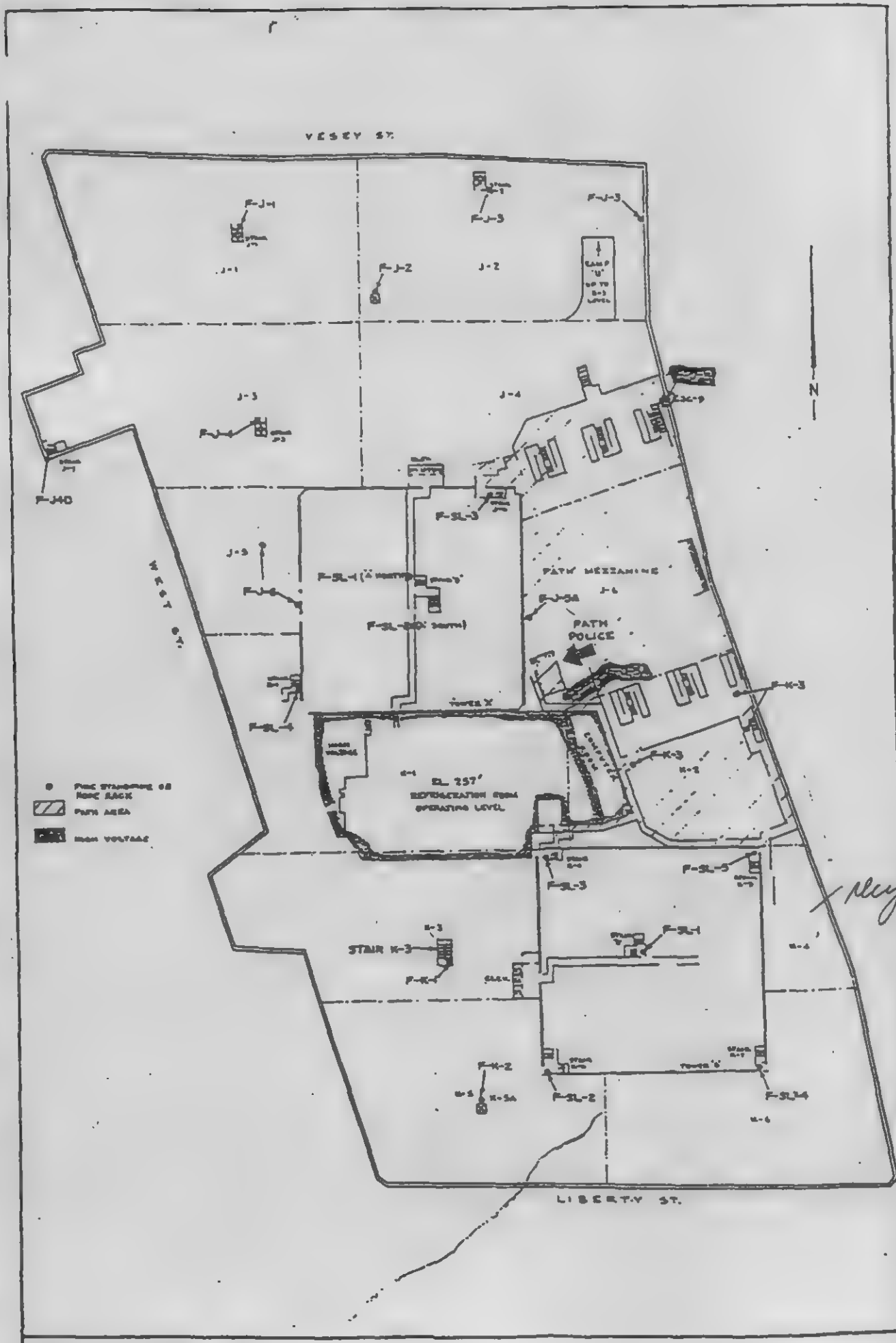


Figure 10.23 Plan

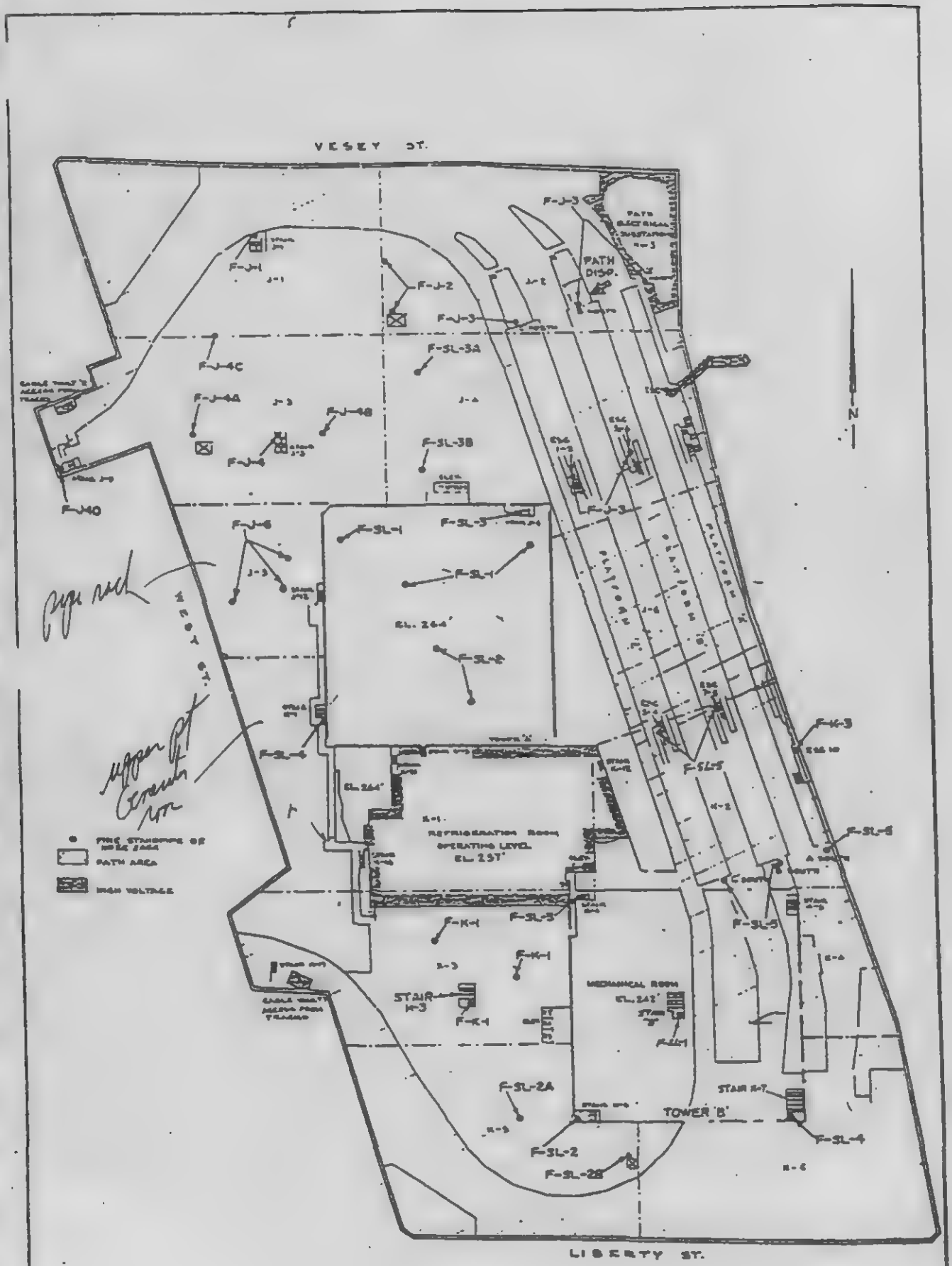


Figure 10.24 Plan

B5

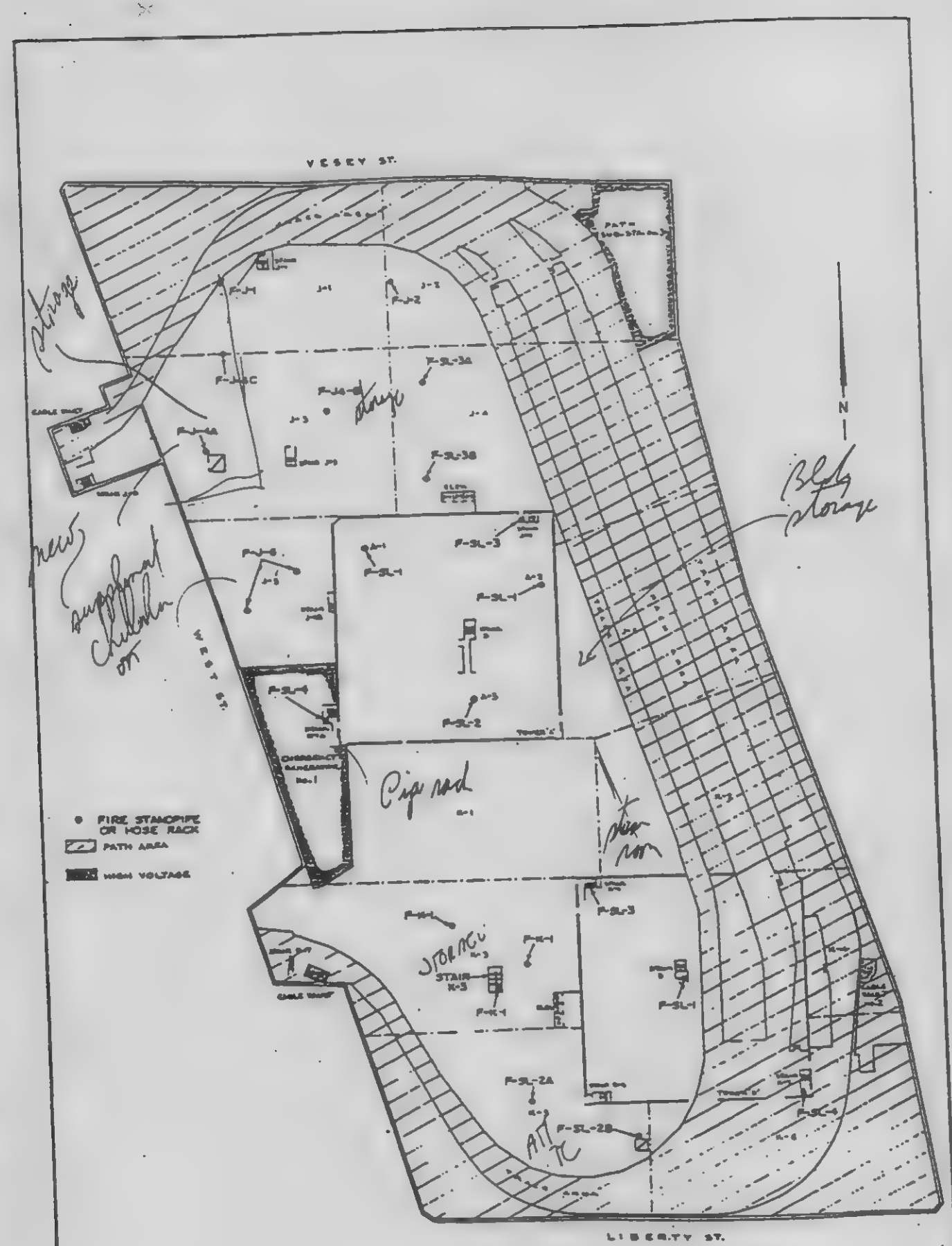
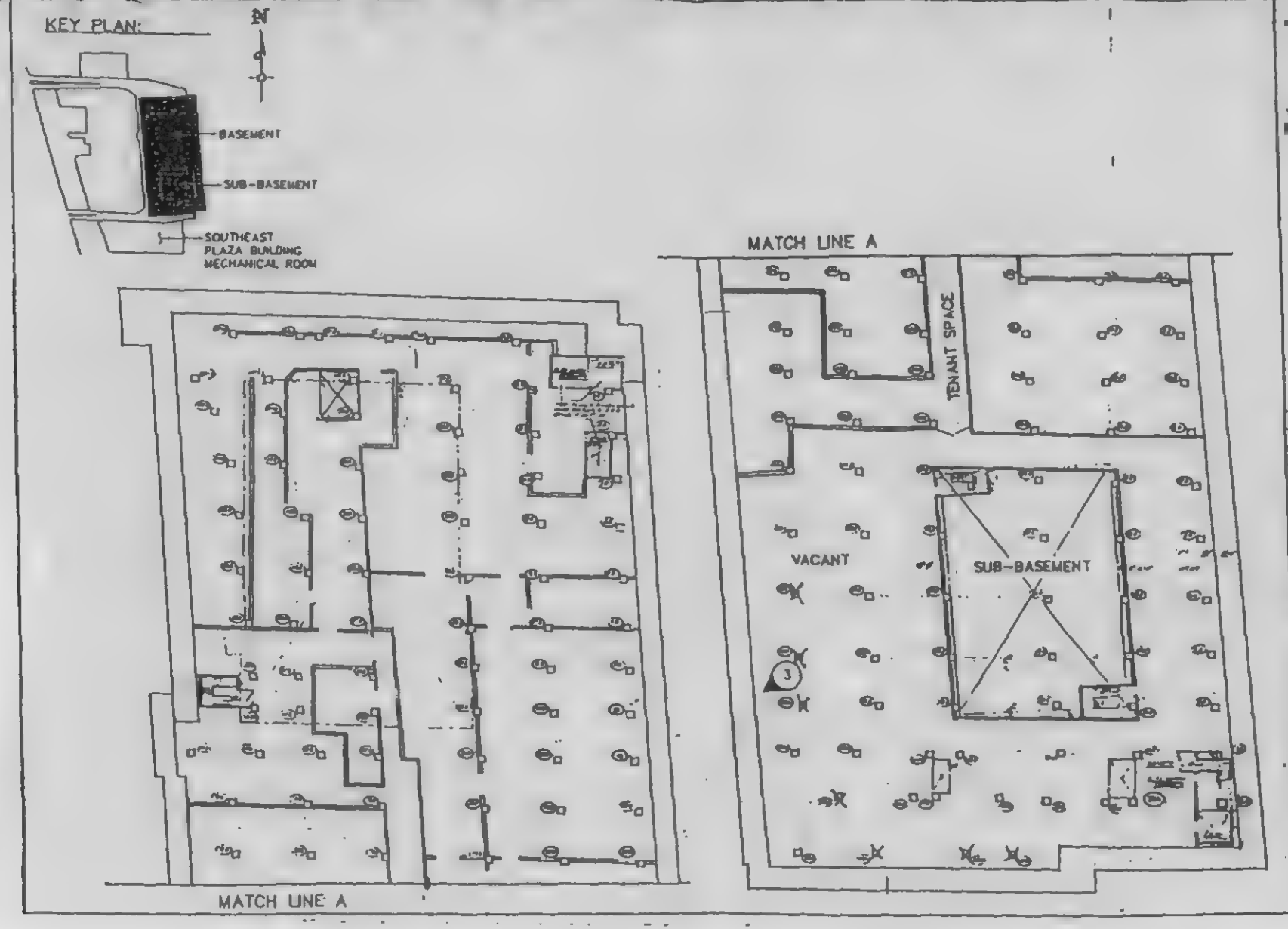


Figure 10.25 Plan

—Level B6



THE PORT AUTHORITY

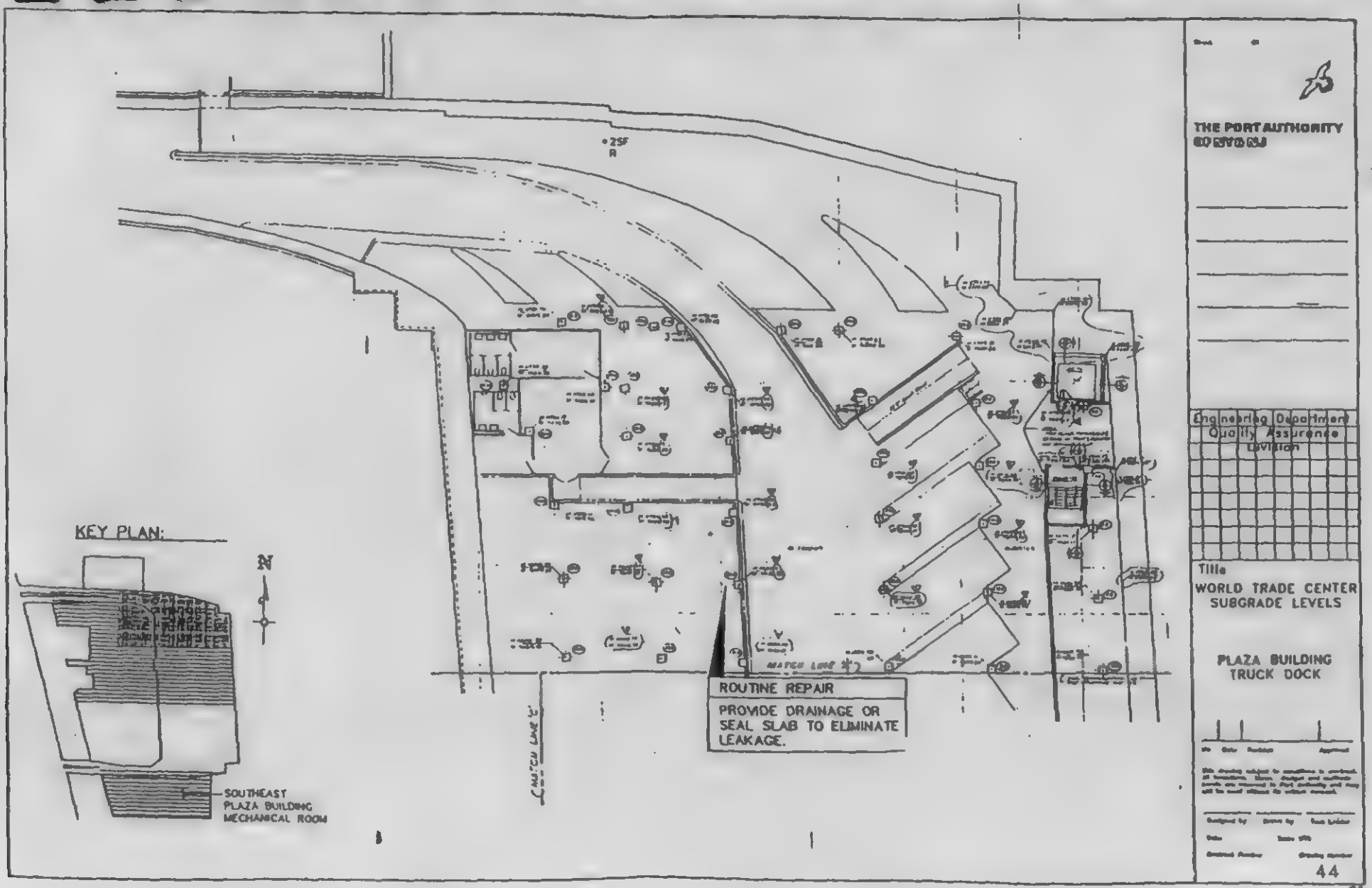
Engineering Department
Quality Assurance Division

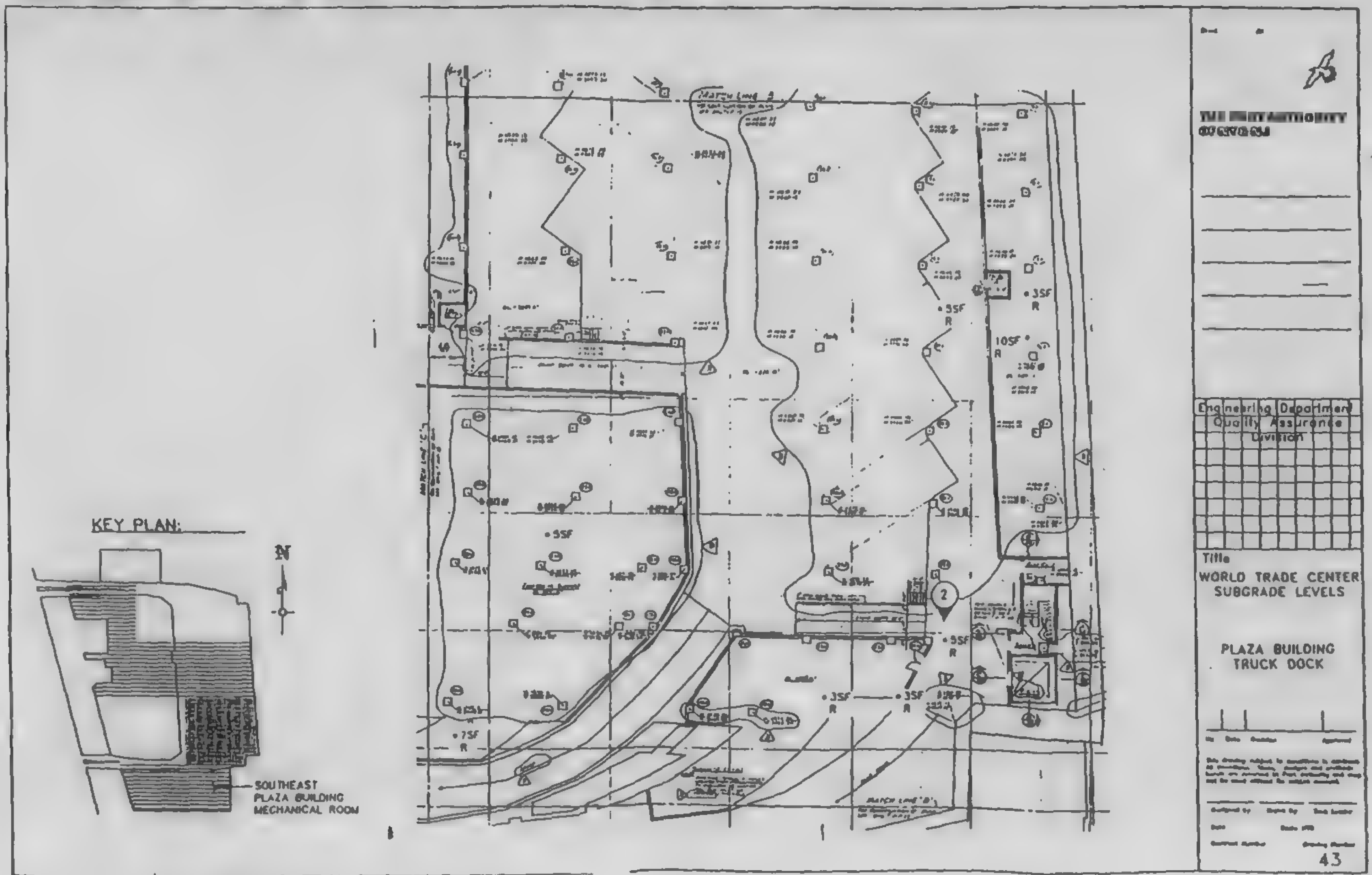
Title
WORLD TRADE CENTER
SUBGRADE LEVELS

PLAZA BUILDING
TRUCK DOCK
BASEMENT AND
SUB-BASEMENT

46

77


KEY PLAN:
SOUTHEAST PLAZA BUILDING MECHANICAL ROOM
ROUTINE REPAIR
PROVIDE DRAINAGE OR SEAL SLAB TO ELIMINATE LEAKAGE.
MATCH LINE
THE PORT AUTHORITY
Engineering Department
Quality Assurance Division
Title
WORLD TRADE CENTER
SUBGRADE LEVELS
PLAZA BUILDING
TRUCK DOCK
44


KEY PLAN:
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SOUTHEAST PLAZA BUILDING MECHANICAL ROOM
Engineering Department
Quality Assurance Division
Title
WORLD TRADE CENTER SUBGRADE LEVELS
PLAZA BUILDING TRUCK DOCK
43
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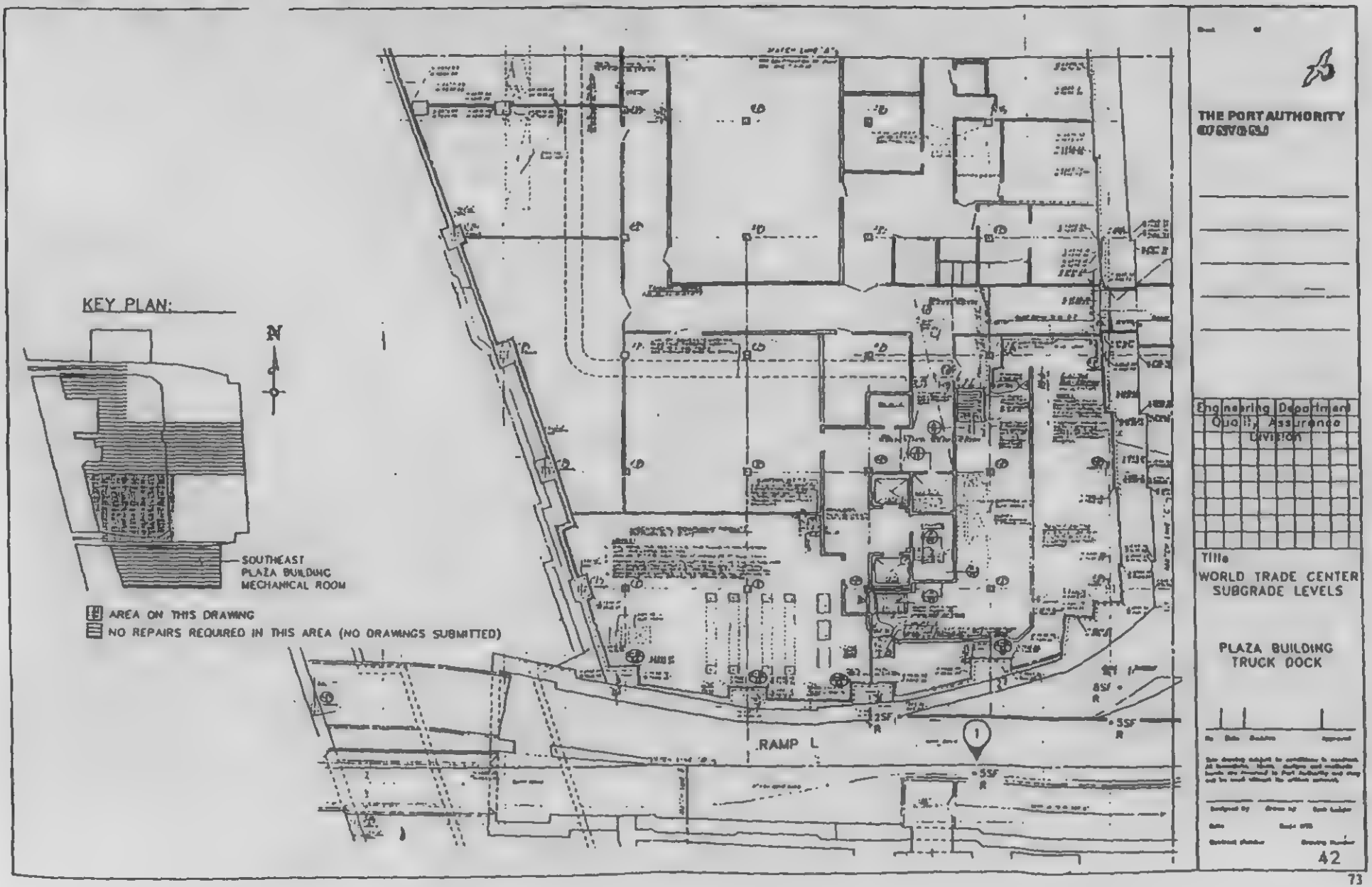
• 3SF R
• 5SF R
• 10SF R
• 7SF R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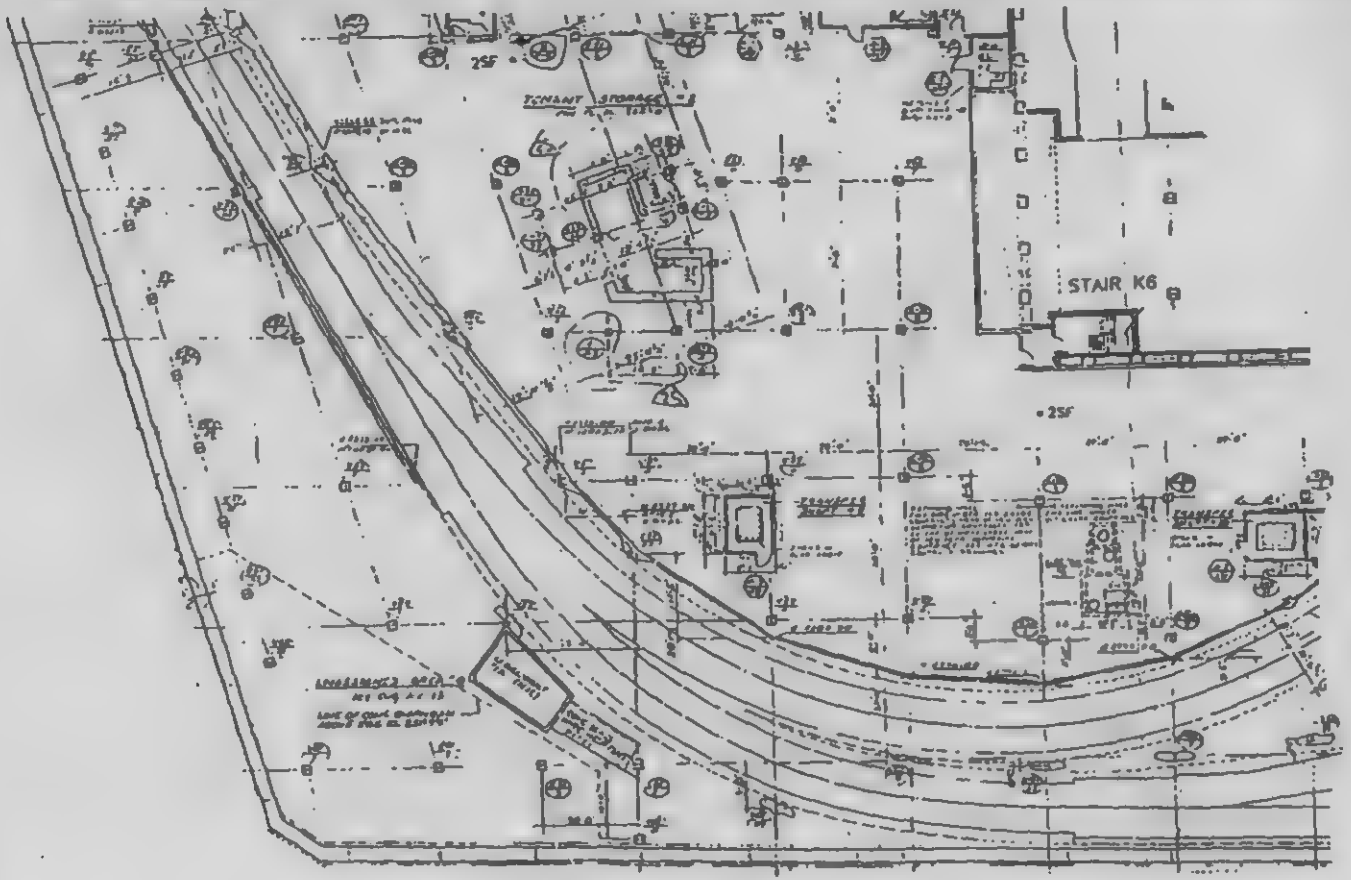
SOUTHEAST
PLAZA BUILDING
MECHANICAL ROOM
AREA ON THIS DRAWING
NO REPAIRS REQUIRED IN THIS AREA (NO DRAWINGS SUBMITTED)
RAMP L
THE PORT AUTHORITY
Engineering Department
Quality Assurance
Division
Title
WORLD TRADE CENTER
SUBGRADE LEVELS
PLAZA BUILDING
TRUCK DOCK
42



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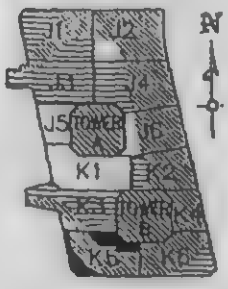
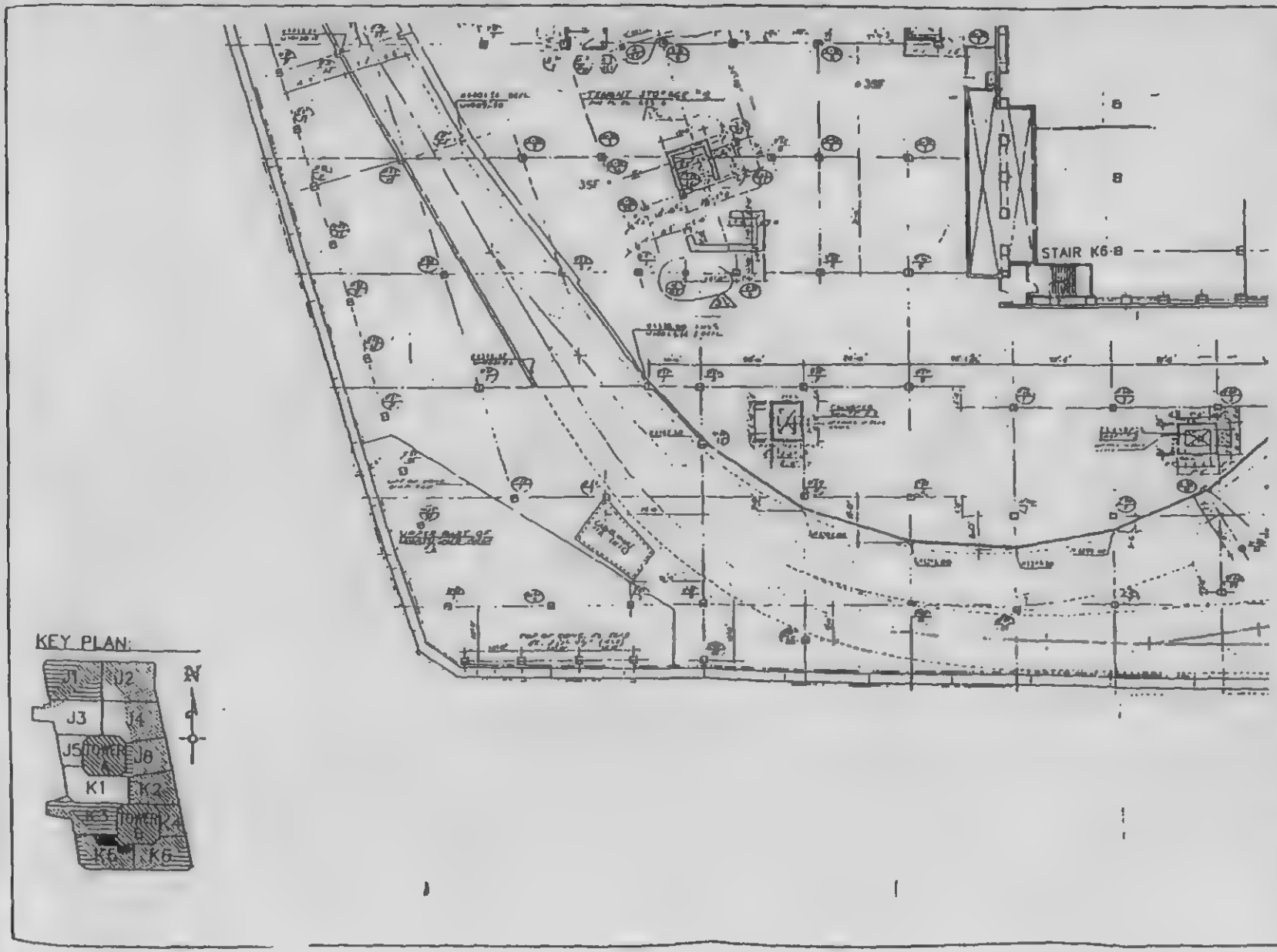


Engineering Department
Quality Assurance Division

Title
WORLD TRADE CENTER
SUBGRADE LEVELS

LEVEL B6
SECTOR K5

35


STAIR K6-B
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J1
J2
J3
J4
J5
J8
K1
K2
K5
K6
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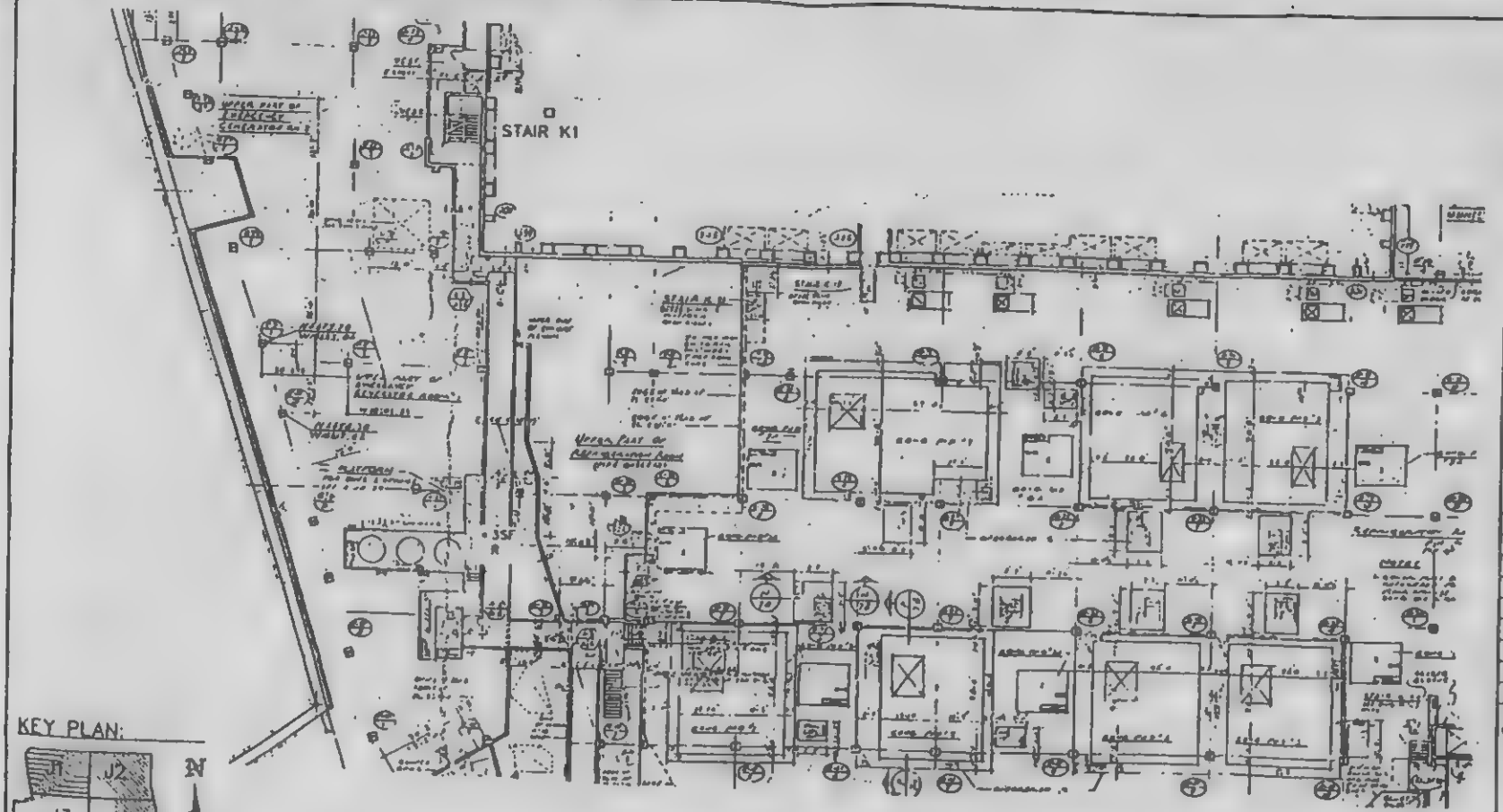
THE PORT AUTHORITY
Engineering Department
Quality Assurance
Division
Title
WORLD TRADE CENTER
SUBGRADE LEVELS
LEVEL B5
SECTOR K5
34



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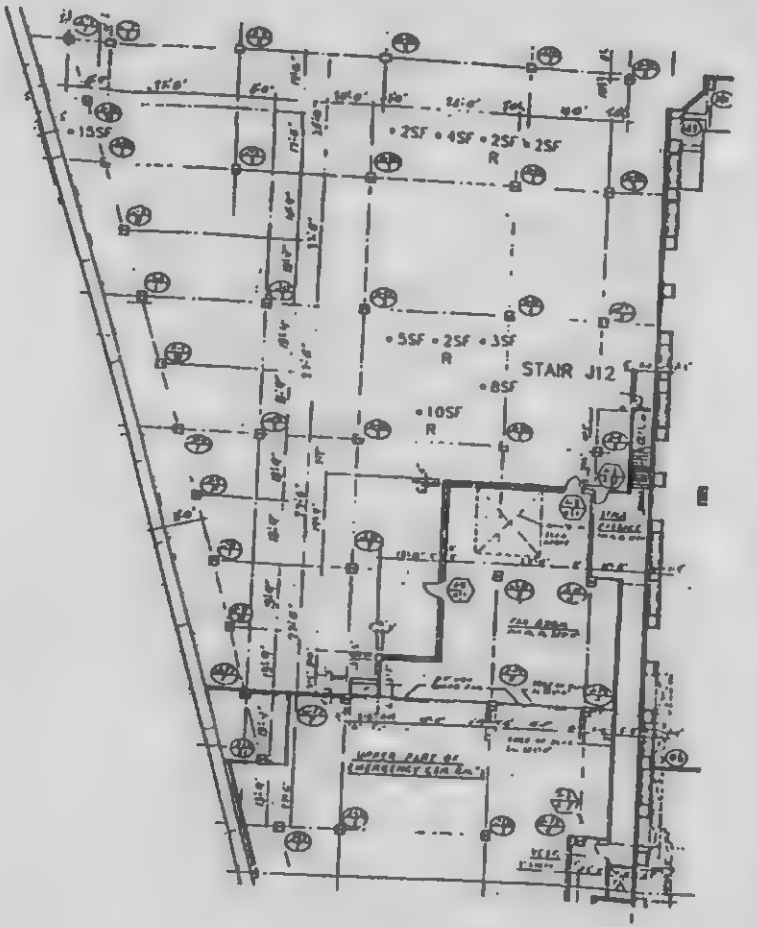
Engineering Department
Quality Assurance Division

Title
WORLD TRADE CENTER
SUBGRADE LEVELS

LEVEL B5
SECTOR K1

33

54



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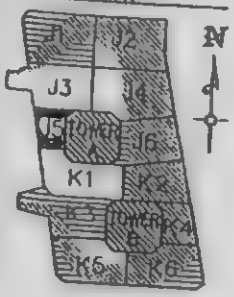


THE PORT AUTHORITY OF NY & NJ

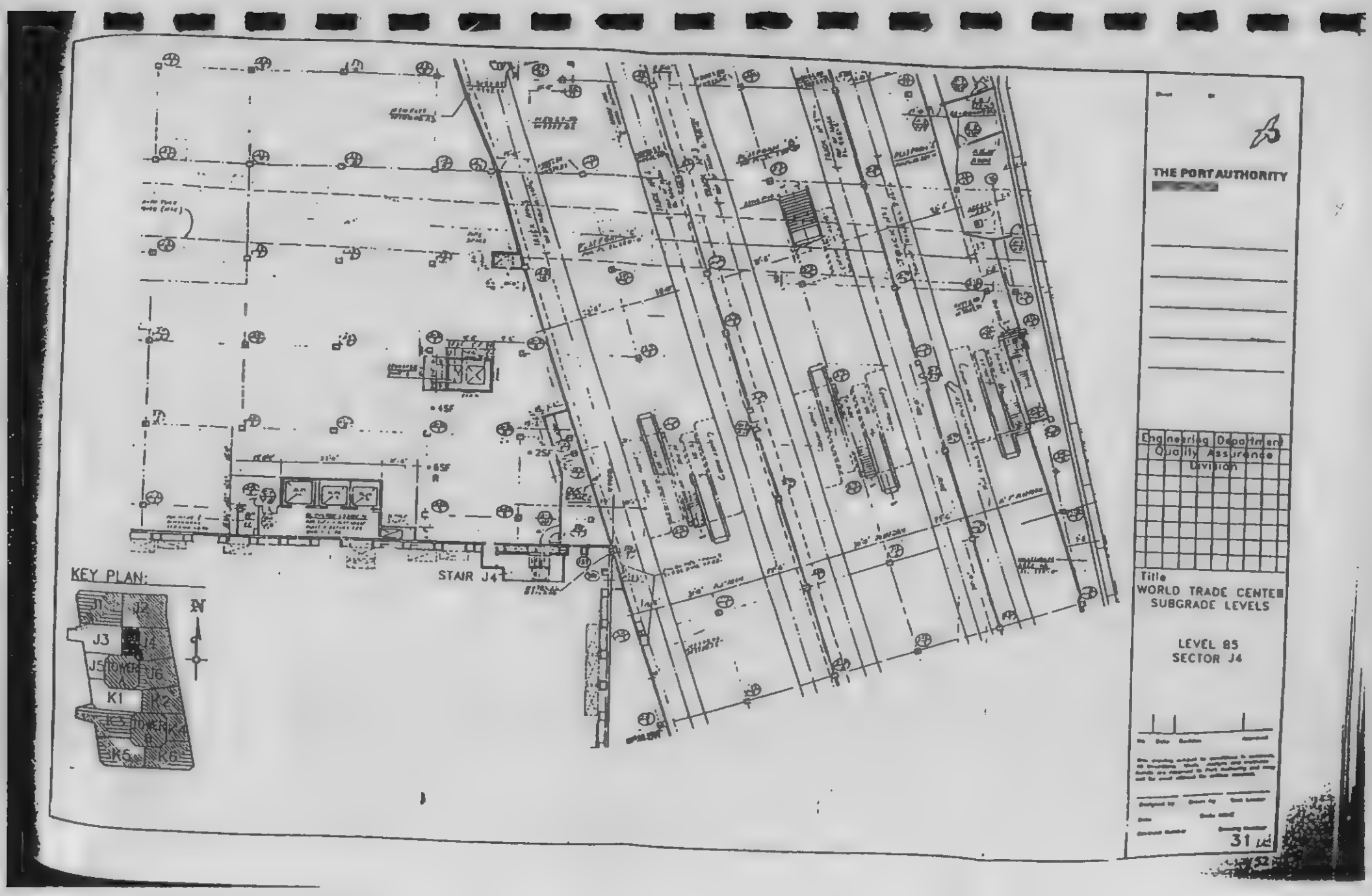
Engineering Department
Quality Assurance Division

Title
WORLD TRADE CENTER
SUBGRADE LEVELS

LEVEL B5
SECTOR J5

32

53


THE PORT AUTHORITY
Engineering Department
Quality Assurance Division
Title
WORLD TRADE CENTER
SUBGRADE LEVELS
LEVEL B5
SECTOR J4
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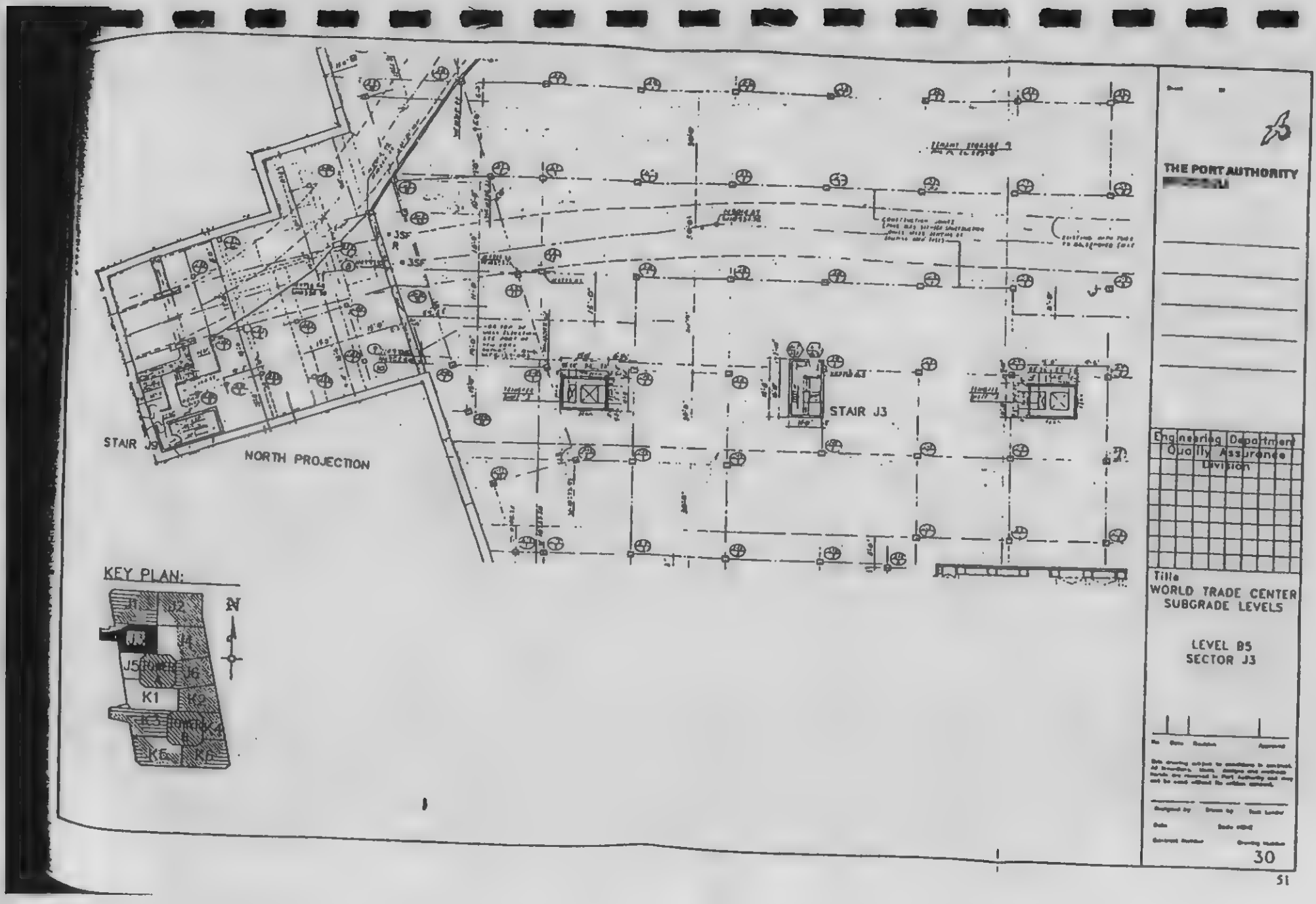
J3
J4
J5
J6
K1
K2
K3
K4
K5
K6
STAIR J4


STAIR J3
NORTH PROJECTION
KEY PLAN:
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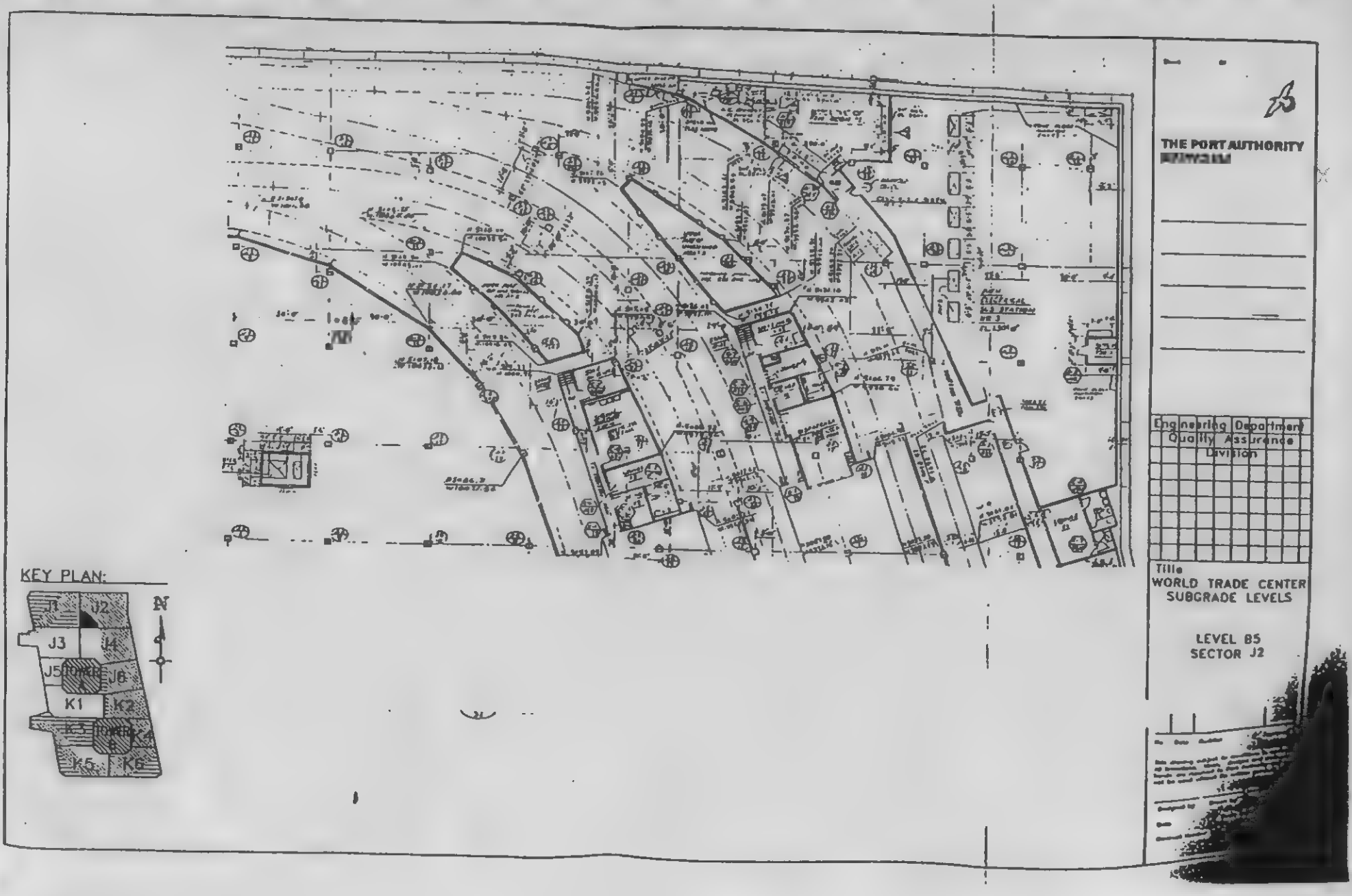
J3
J4
J5 TOWER
J6
K1
K2
K3 TOWER
K4
K5
K6
THE PORT AUTHORITY
Engineering Department
Quality Assurance Division
Title
WORLD TRADE CENTER
SUBGRADE LEVELS
LEVEL B5
SECTOR J3
30


THE PORT AUTHORITY
Engineering Department
Quality Assurance Division
Title
WORLD TRADE CENTER
SUBGRADE LEVELS
LEVEL B5
SECTOR J2
KEY PLAN:
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J2
J3
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J5
J6
K1
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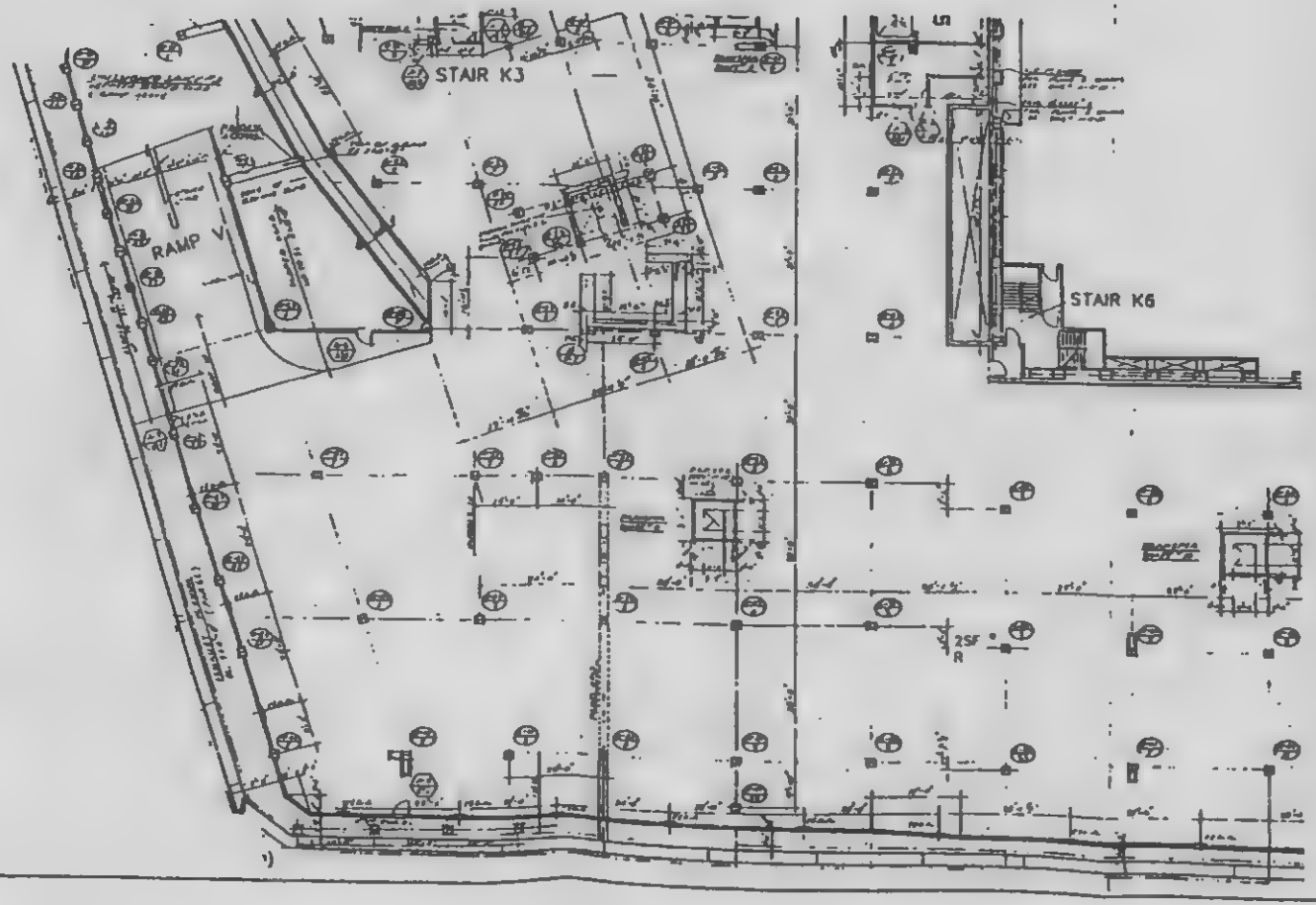
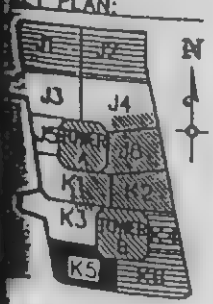
K6





KEY PLAN:

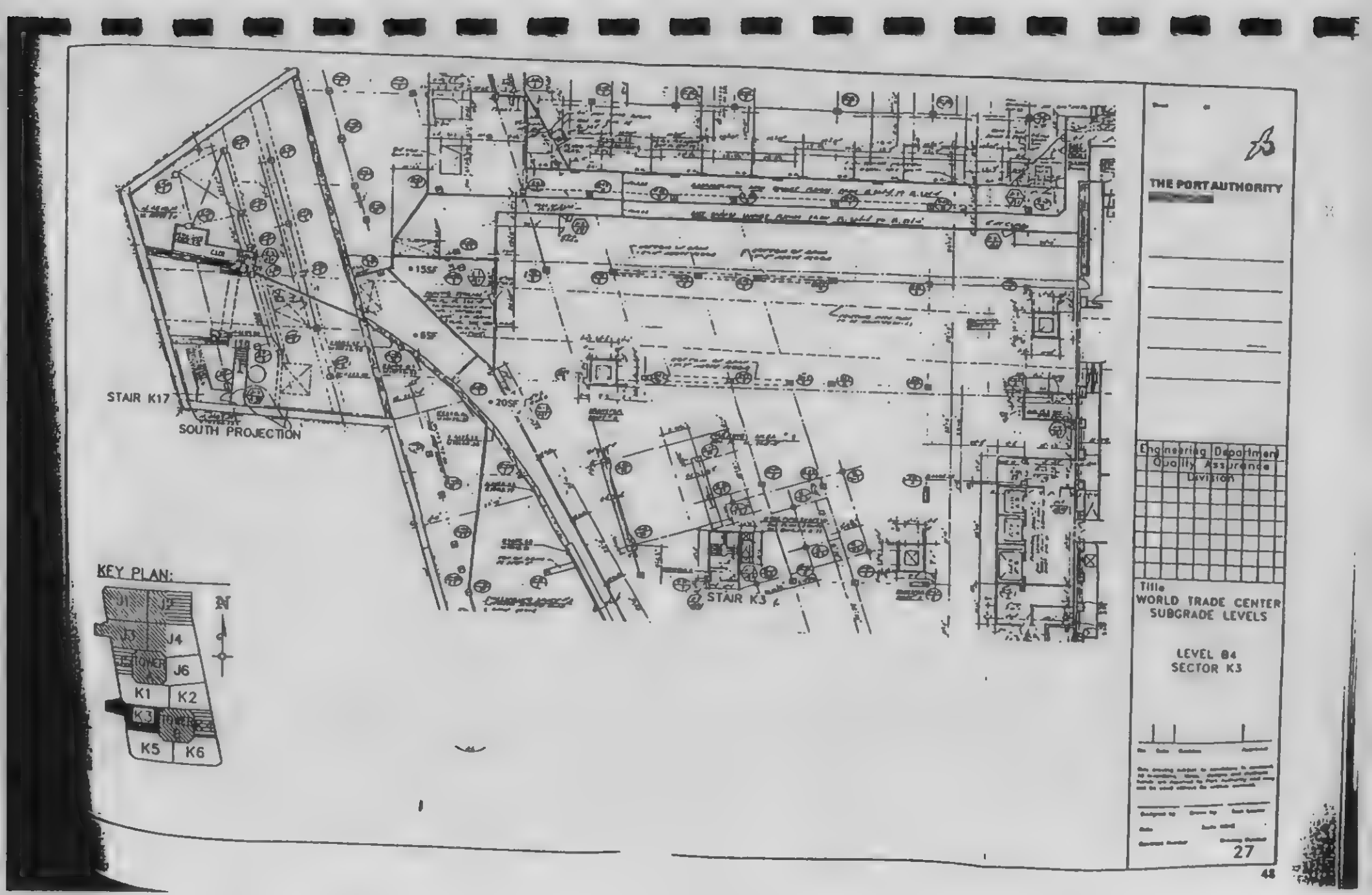
THE PORT AUTHORITY

Engineering Department
Quality Assurance
Division

Title
WORLD TRADE CENTER
SUBGRADE LEVELS

LEVEL B4
SECTOR K5

28


THE PORT AUTHORITY
Engineering Department
Quality Assurance
Division
Title
WORLD TRADE CENTER
SUBGRADE LEVELS
LEVEL B4
SECTOR K3
27
STAIR K17
SOUTH PROJECTION
STAIR K3
KEY PLAN:
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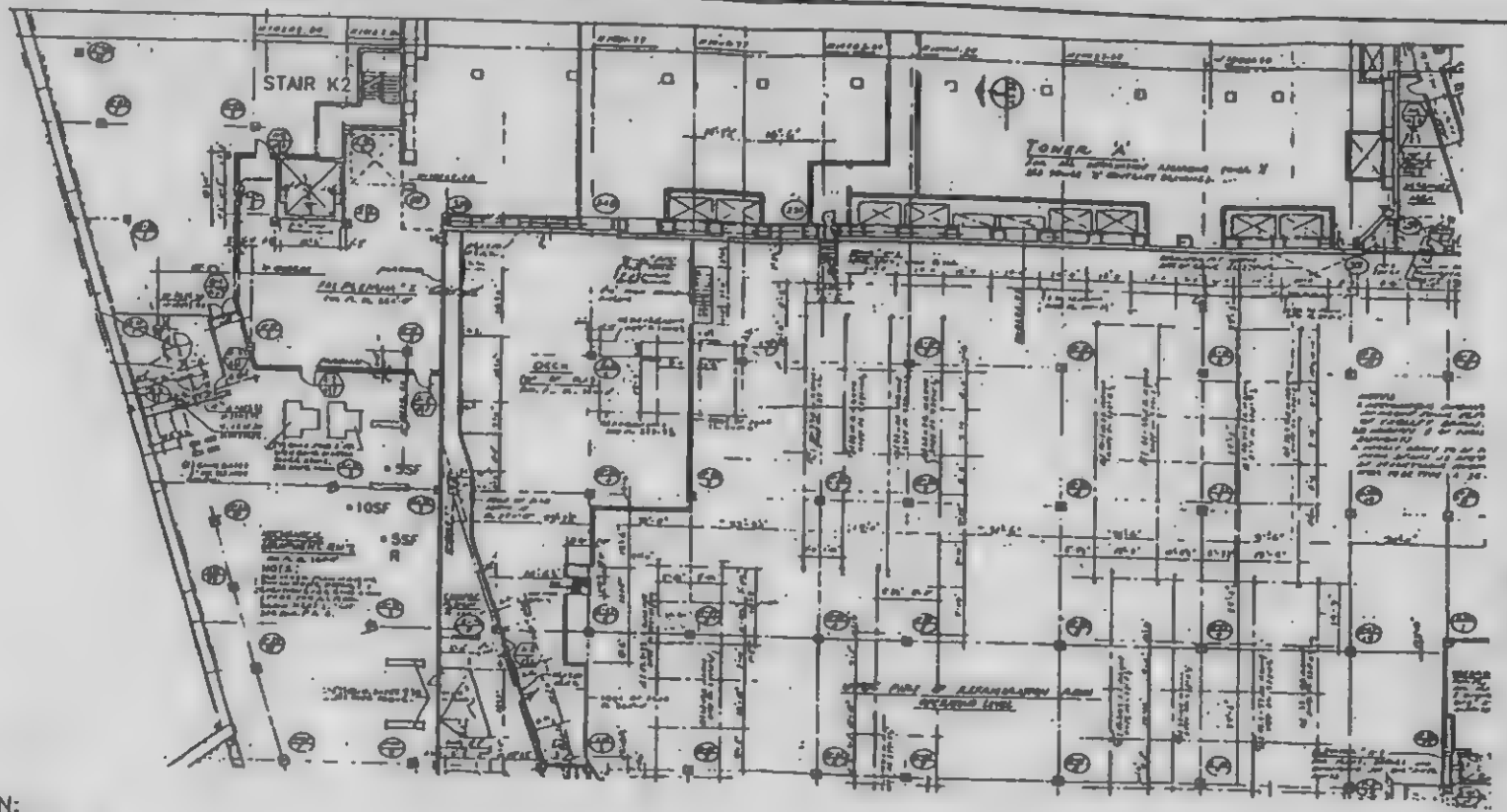
J1
J2
J3
J4
J5
J6
K1
K2
K3
K5
K6



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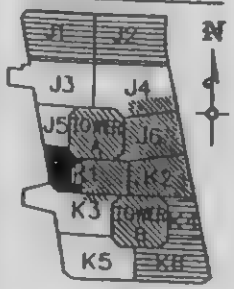


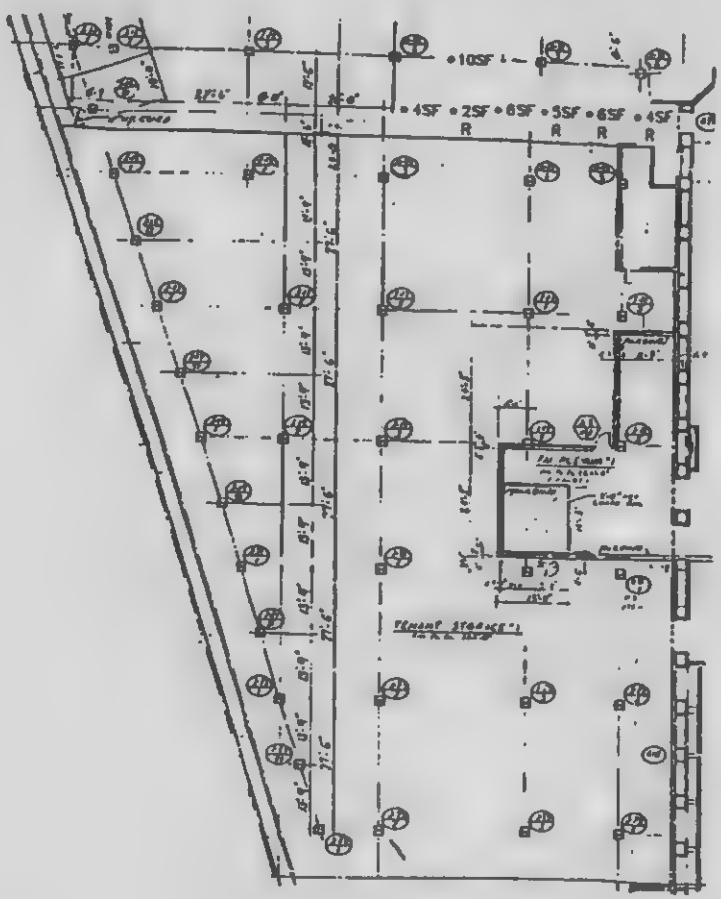
THE PORT AUTHORITY

Engineering Department
Quality Assurance Division

Title
WORLD TRADE CENTER
SUBGRADE LEVELS

LEVEL B4
SECTOR K1

26



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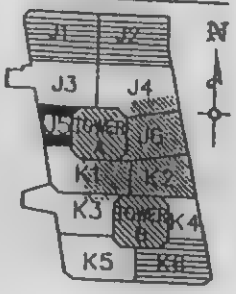


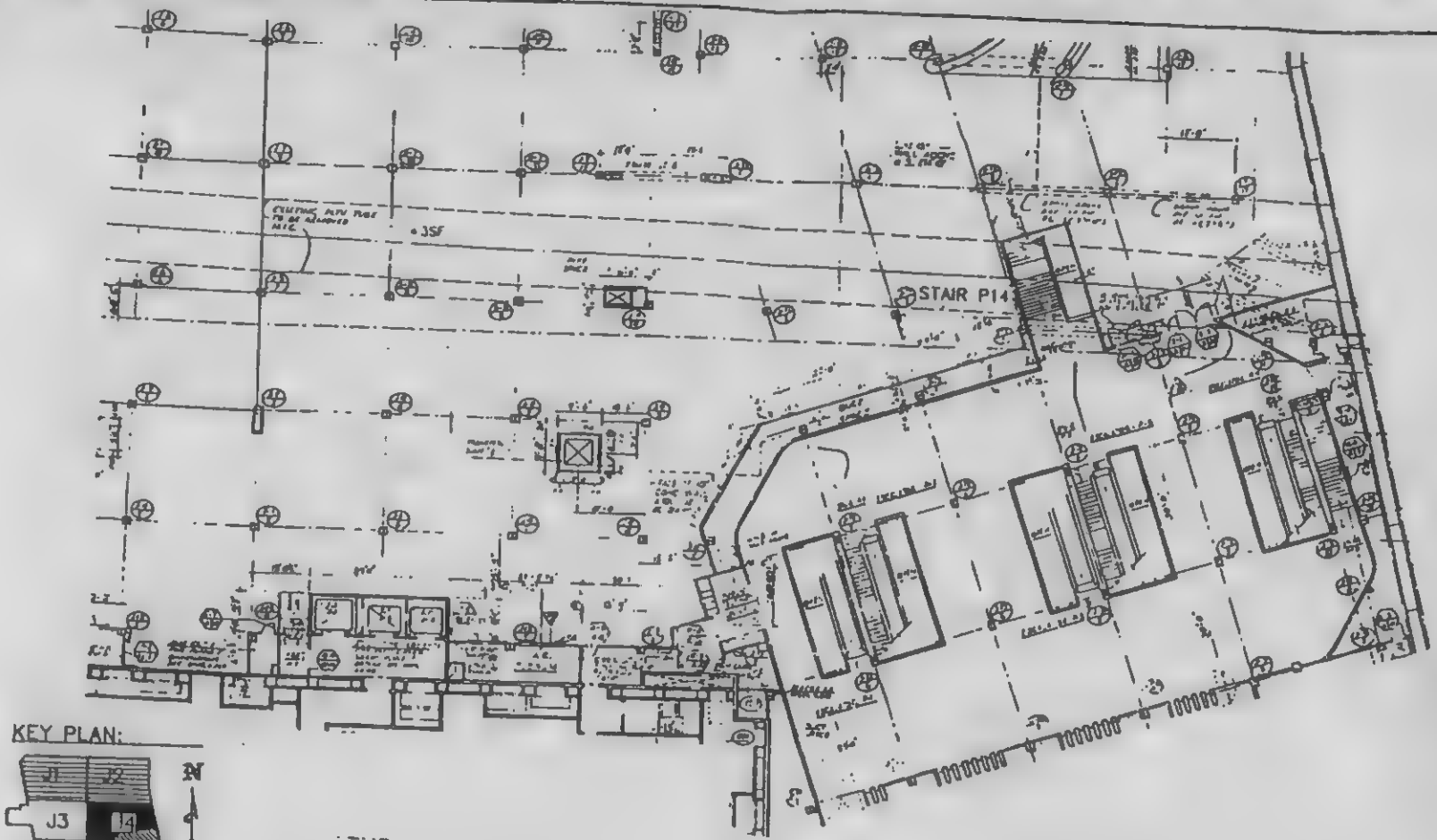
THE PORT AUTHORITY OF NY & NJ

Engineering Department
Quality Assurance Division

Title
WORLD TRADE CENTER
SUBGRADE LEVELS

LEVEL B4
SECTOR J5

25



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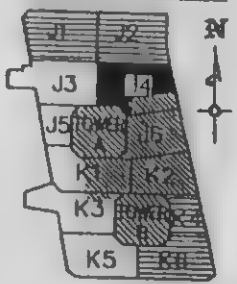


THE PORT AUTHORITY

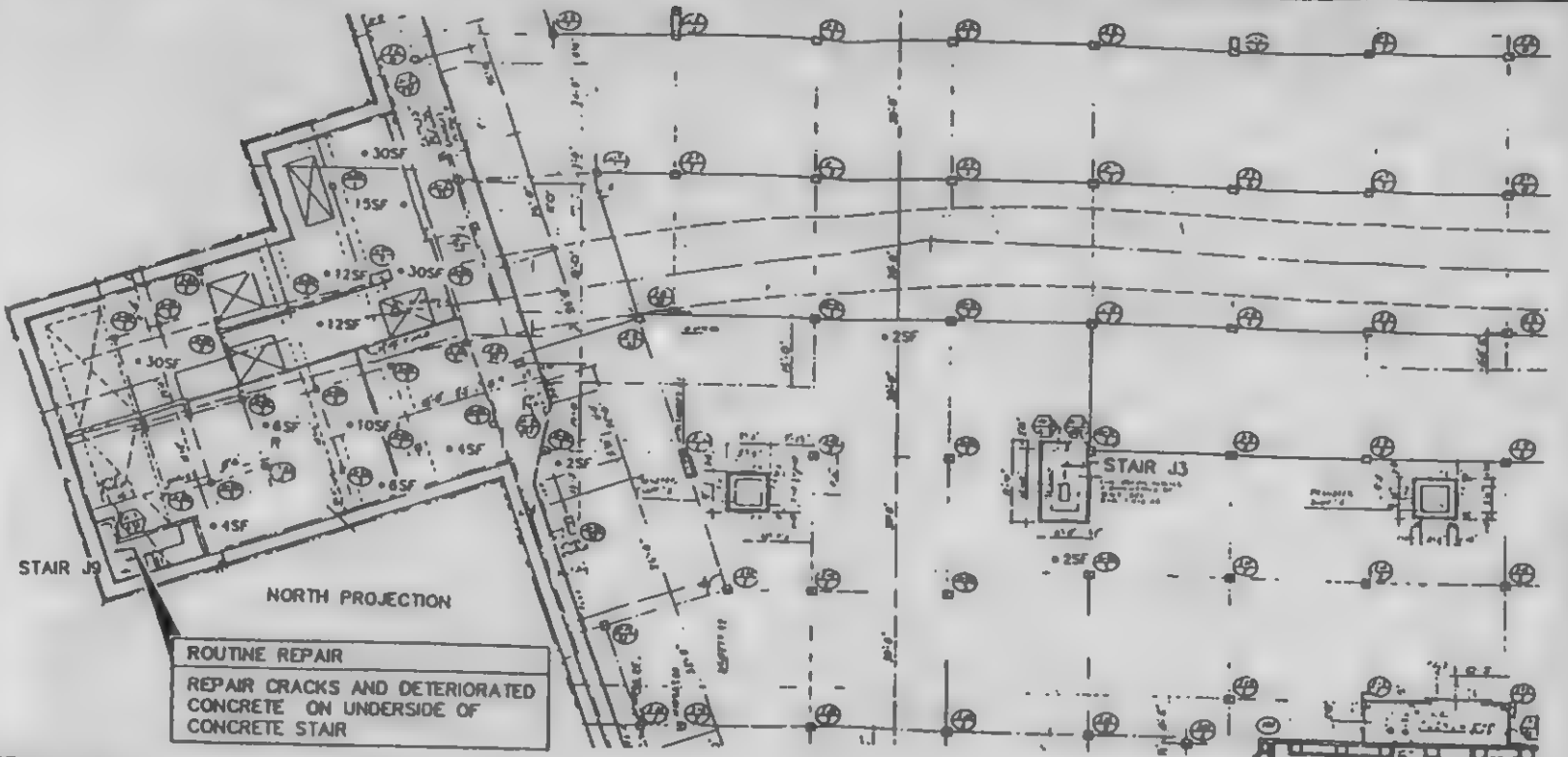
Engineering Department
Quality Assurance Division

Title
WORLD TRADE CENTER
SUBGRADE LEVELS

LEVEL B4
SECTOR J4

24

45



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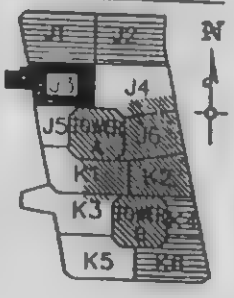


THE PORT AUTHORITY

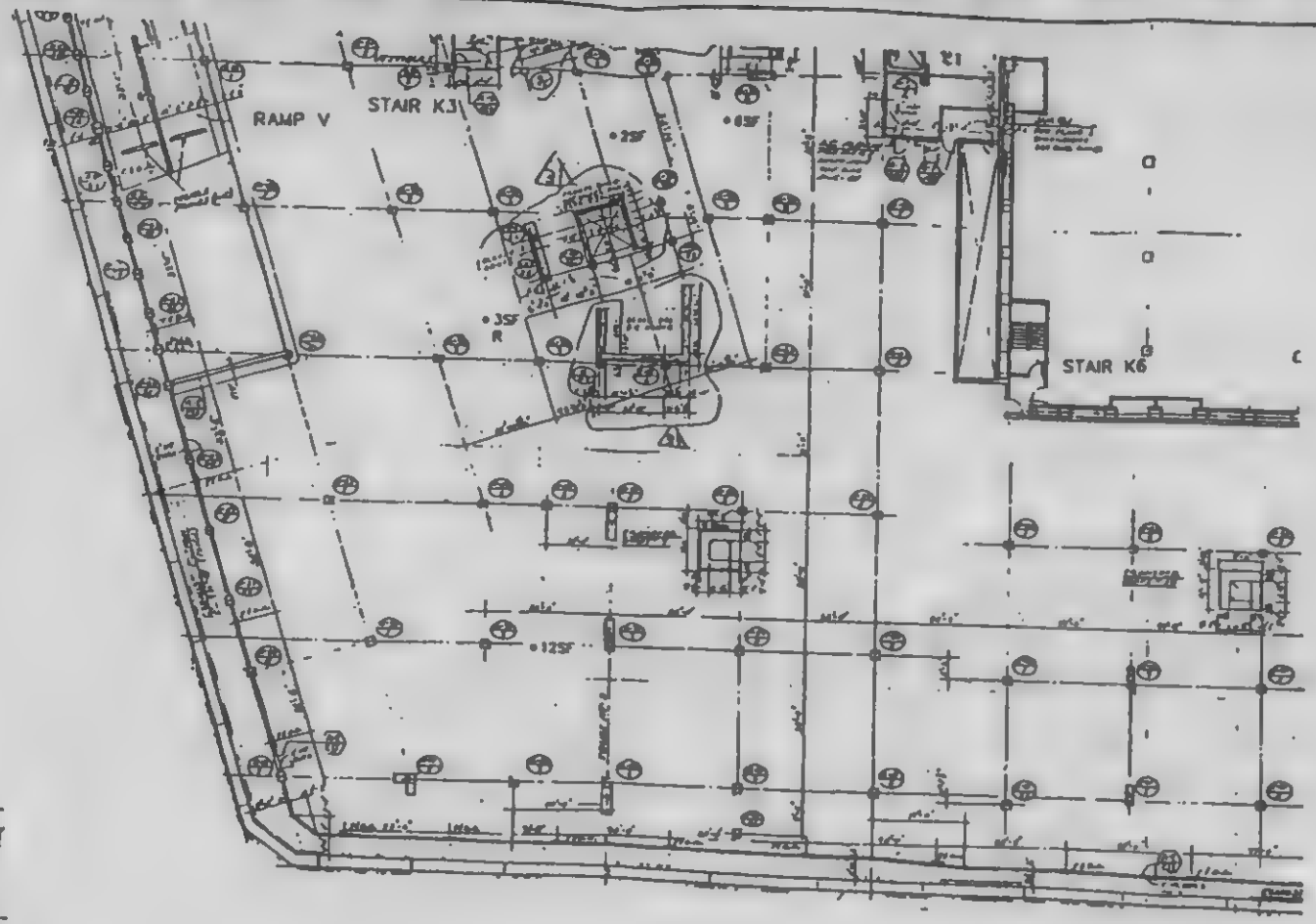
Engineering Department
Quality Assurance Division

Title
WORLD TRADE CENTER
SUBGRADE LEVELS

LEVEL B4
SECTOR J3

23

44



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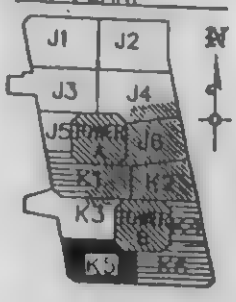

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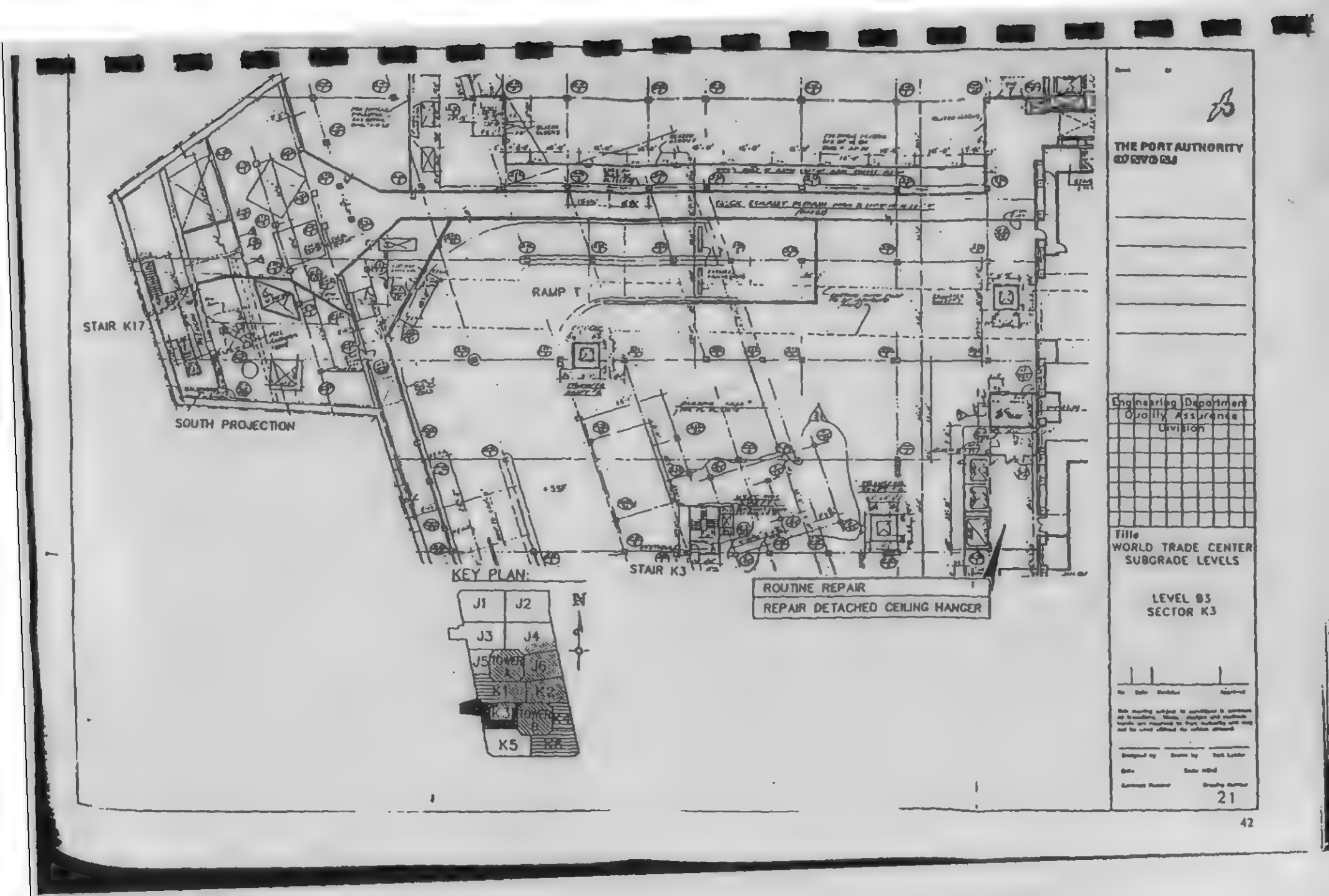
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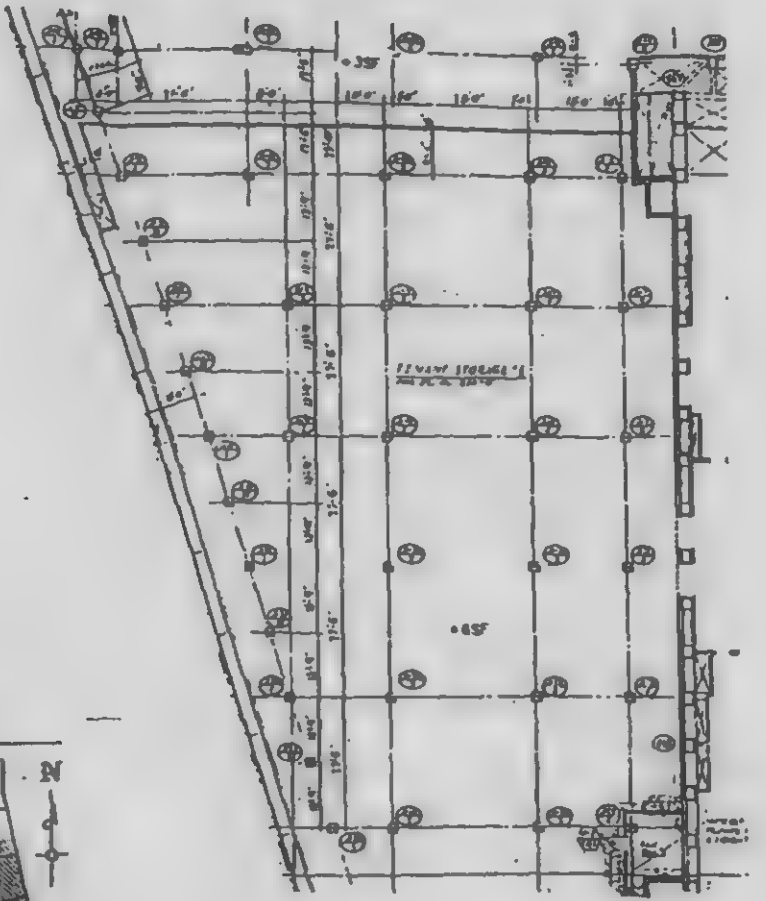

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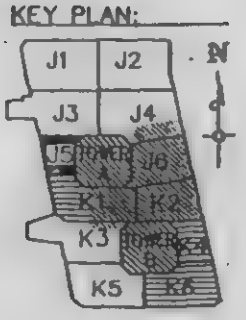

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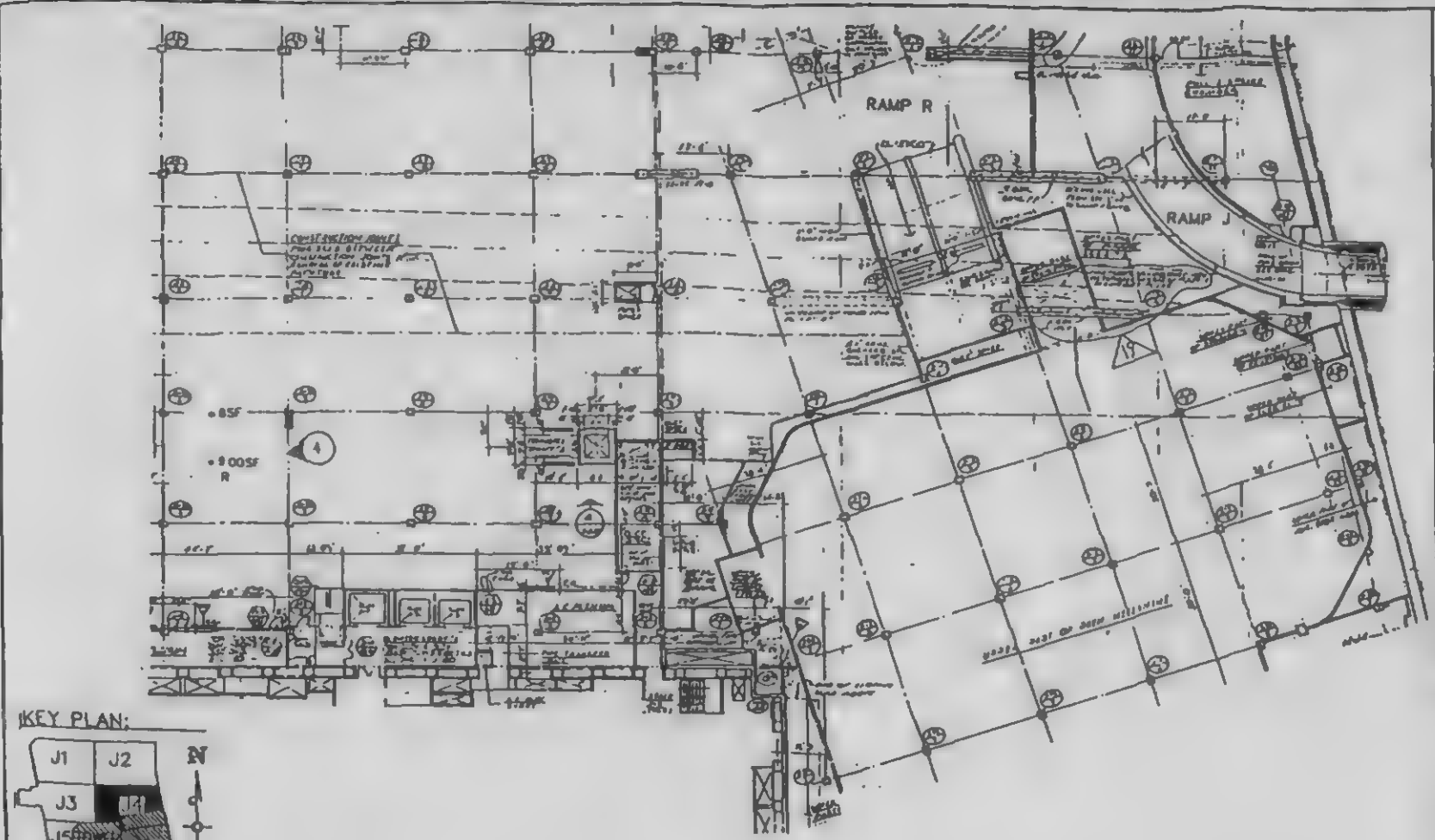

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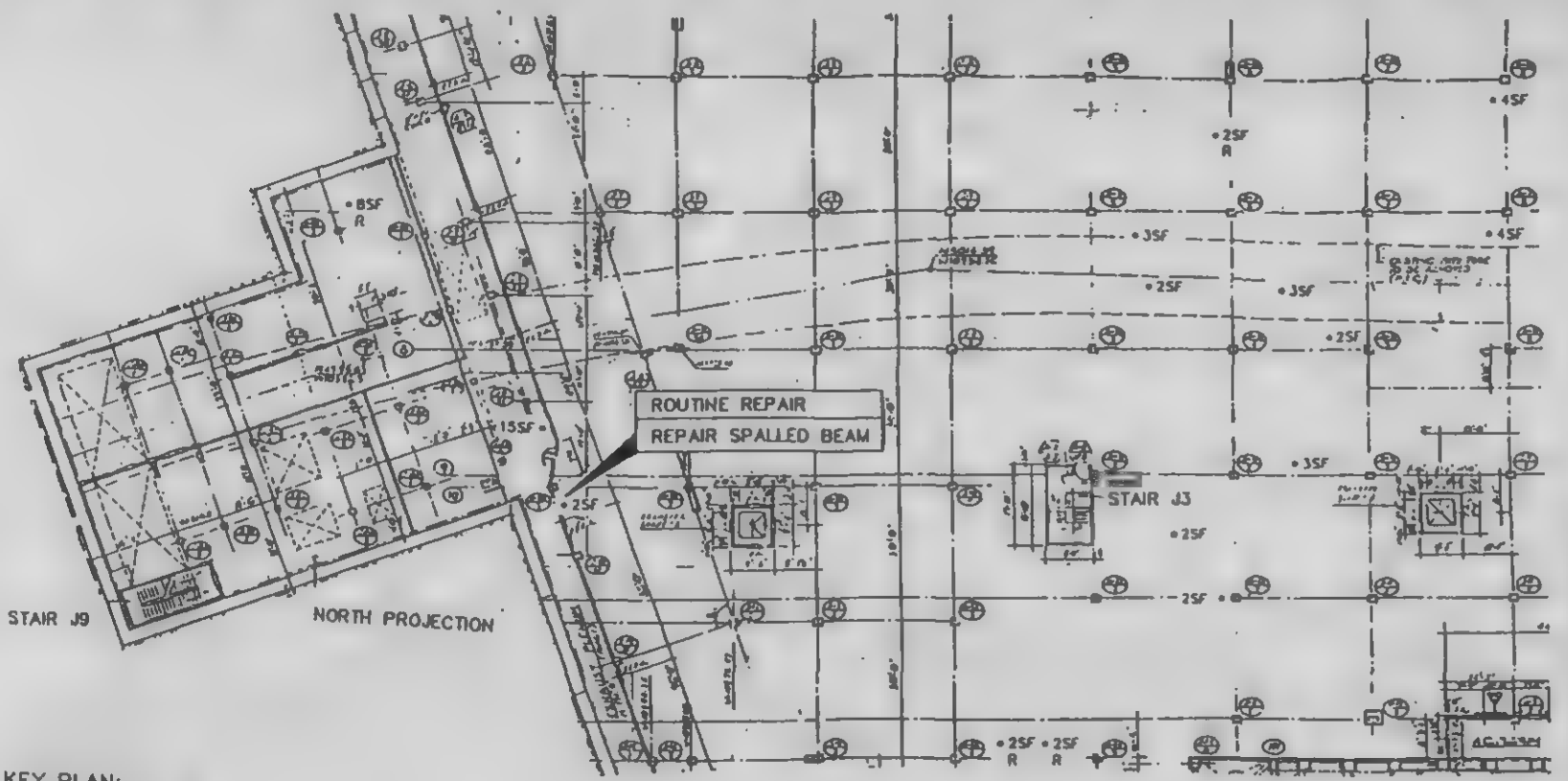

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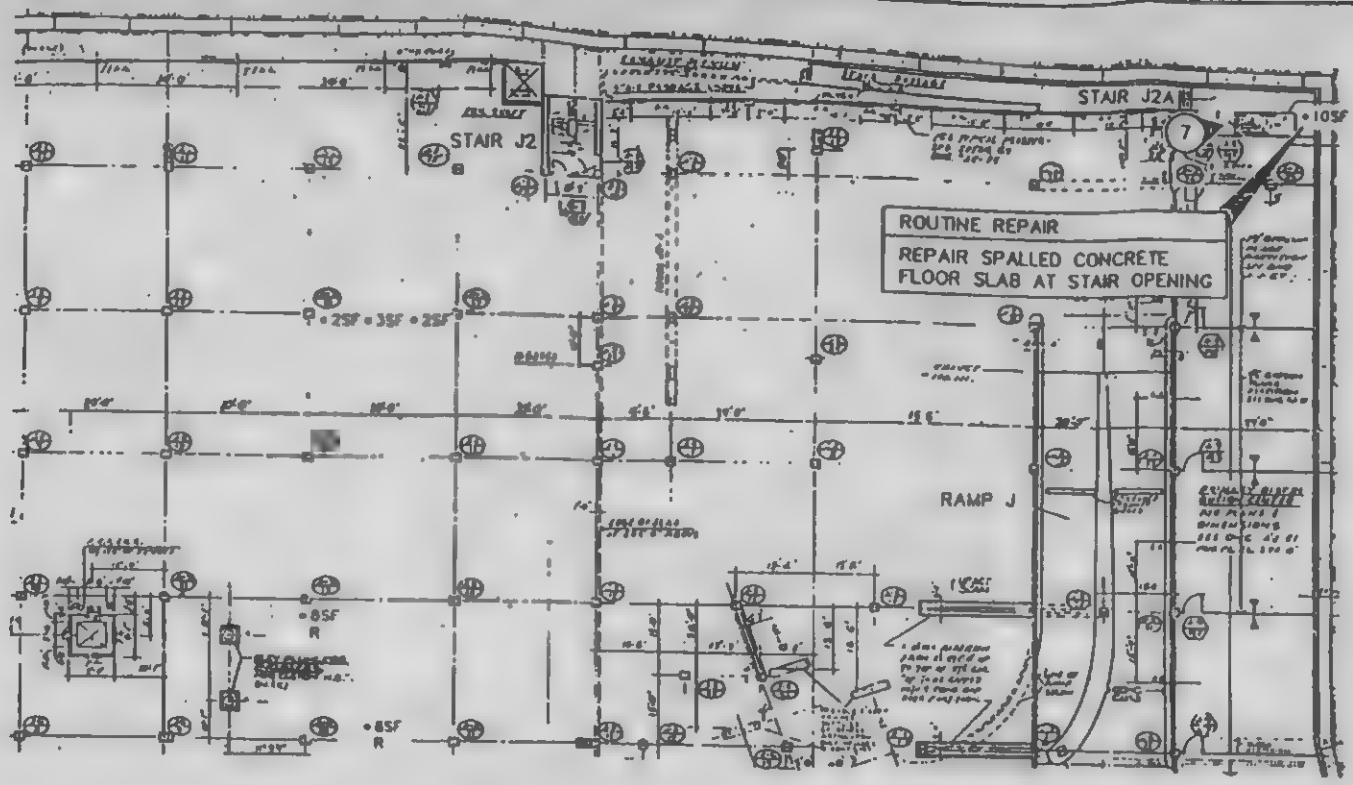

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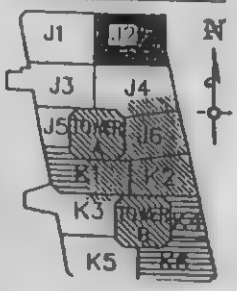

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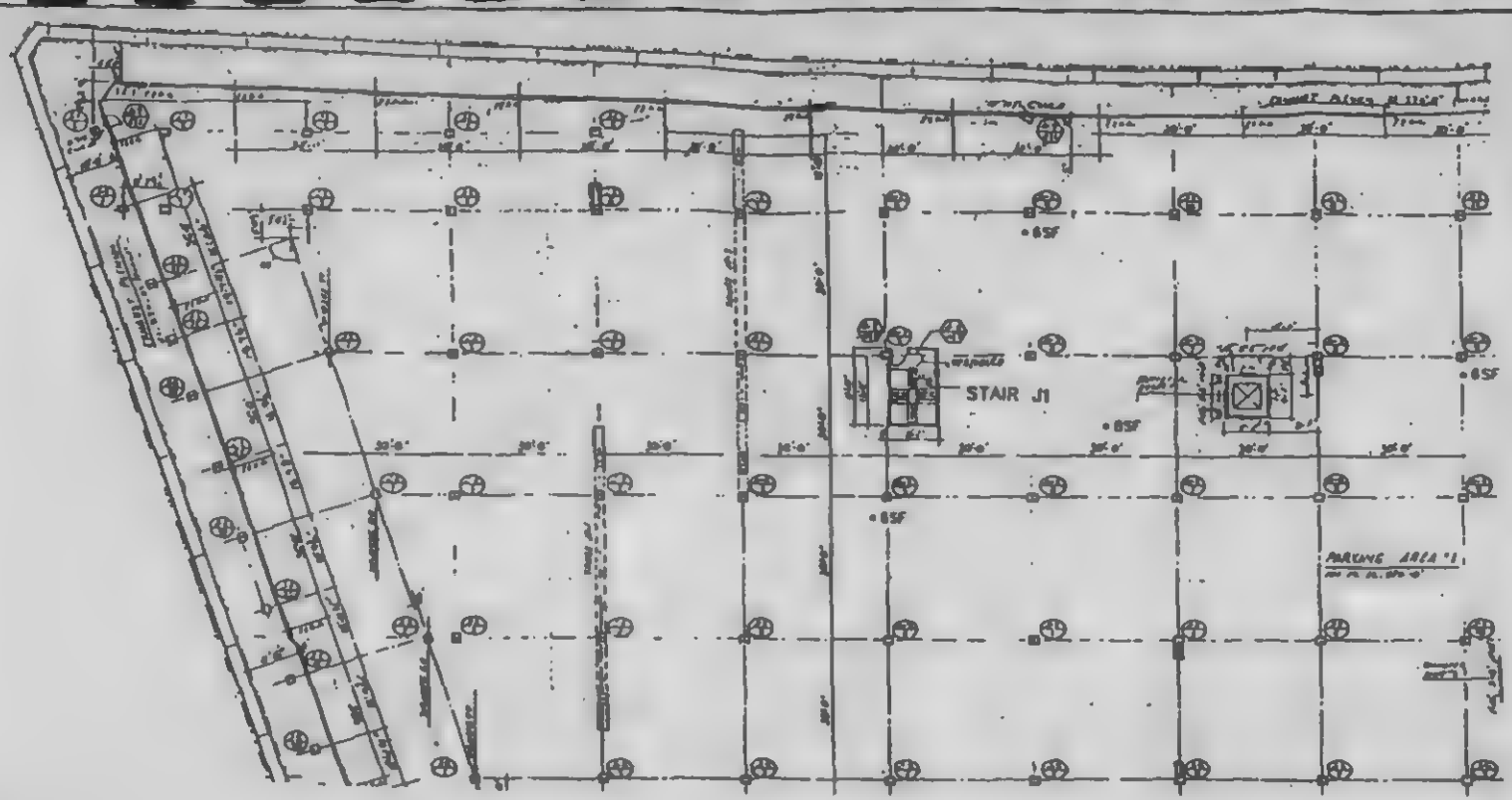

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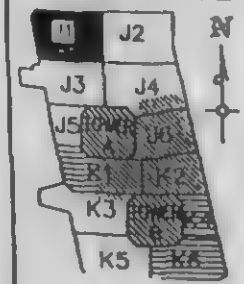

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Quality Assurance Division

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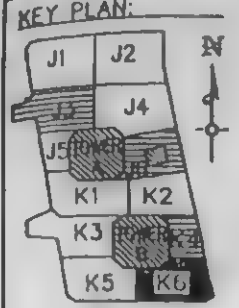

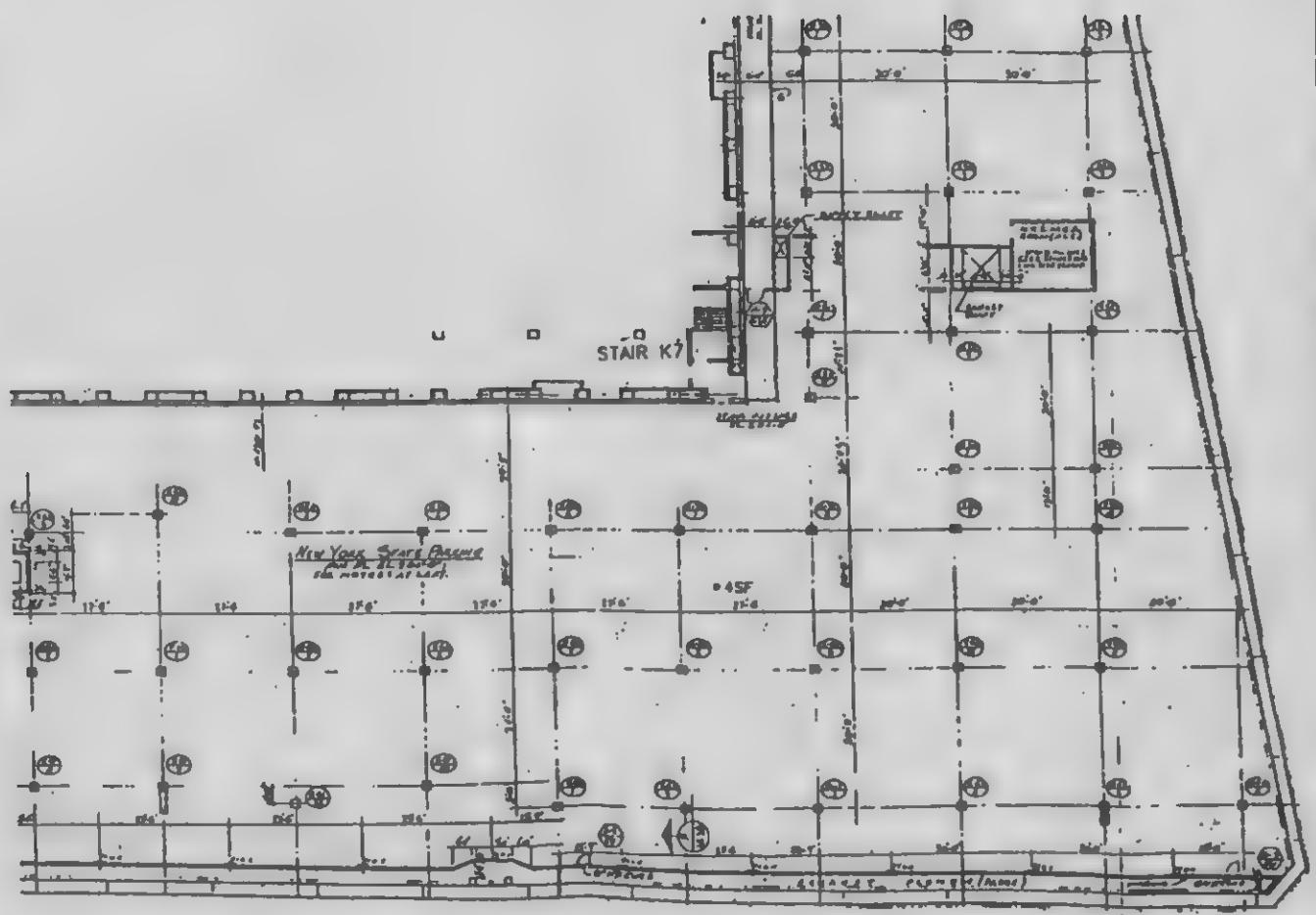

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Quality Assurance Division

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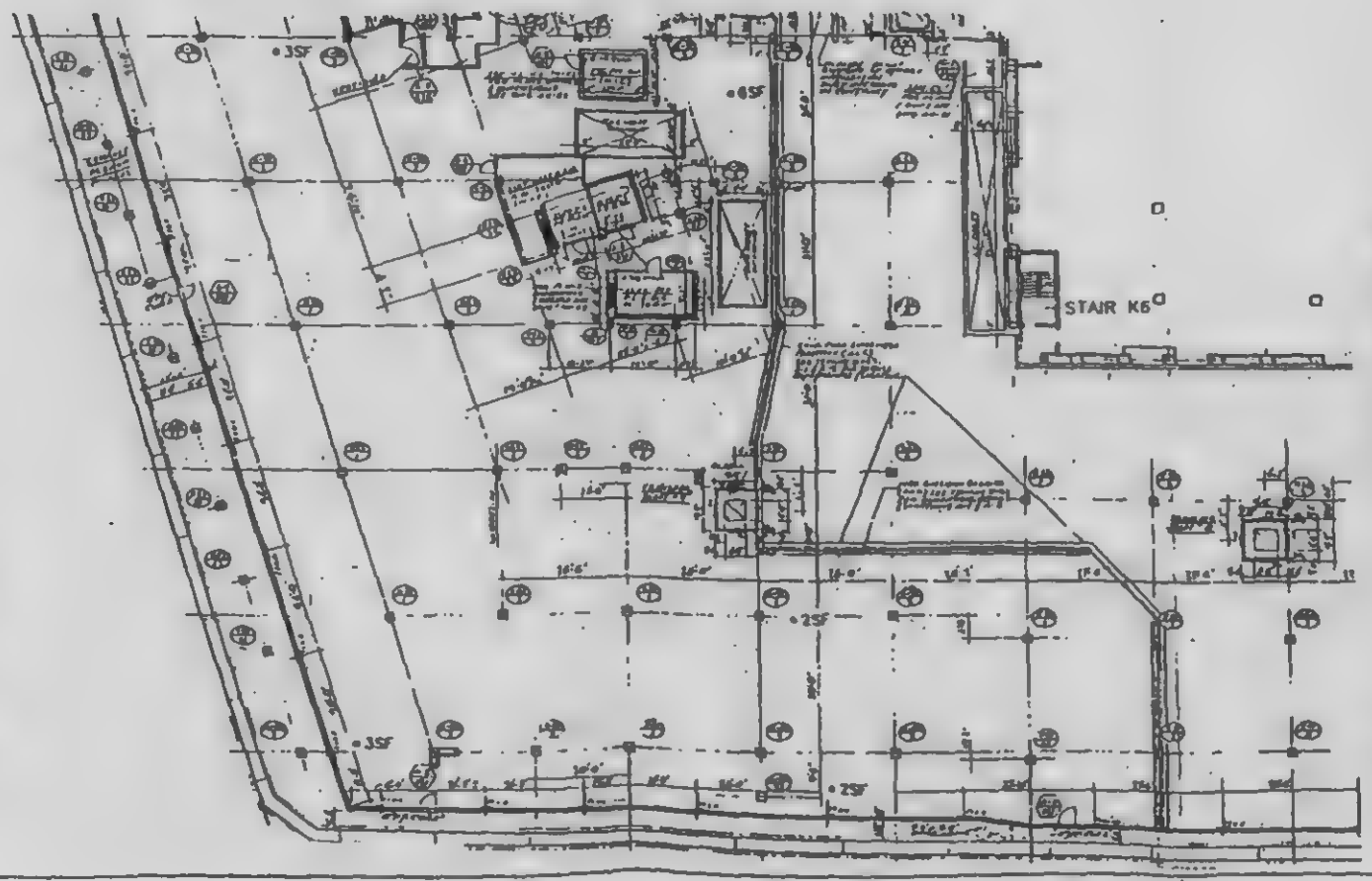

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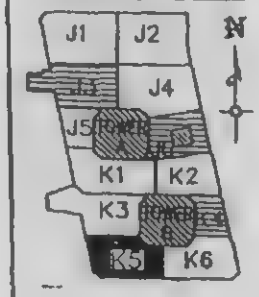

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Quality Assurance Division

Title
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SUBGRADE LEVELS

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SECTOR K5

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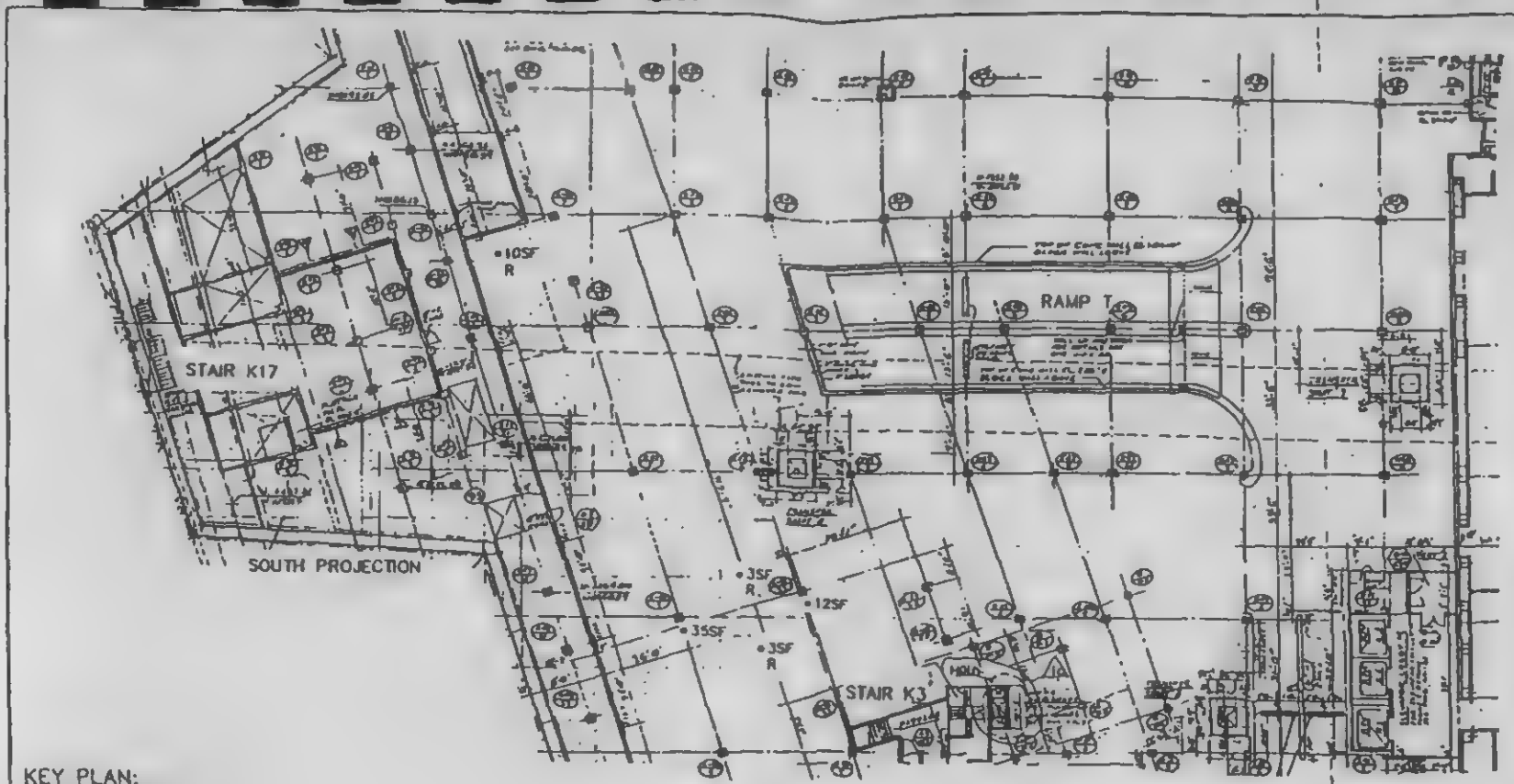

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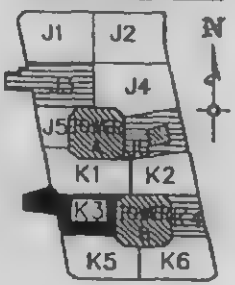

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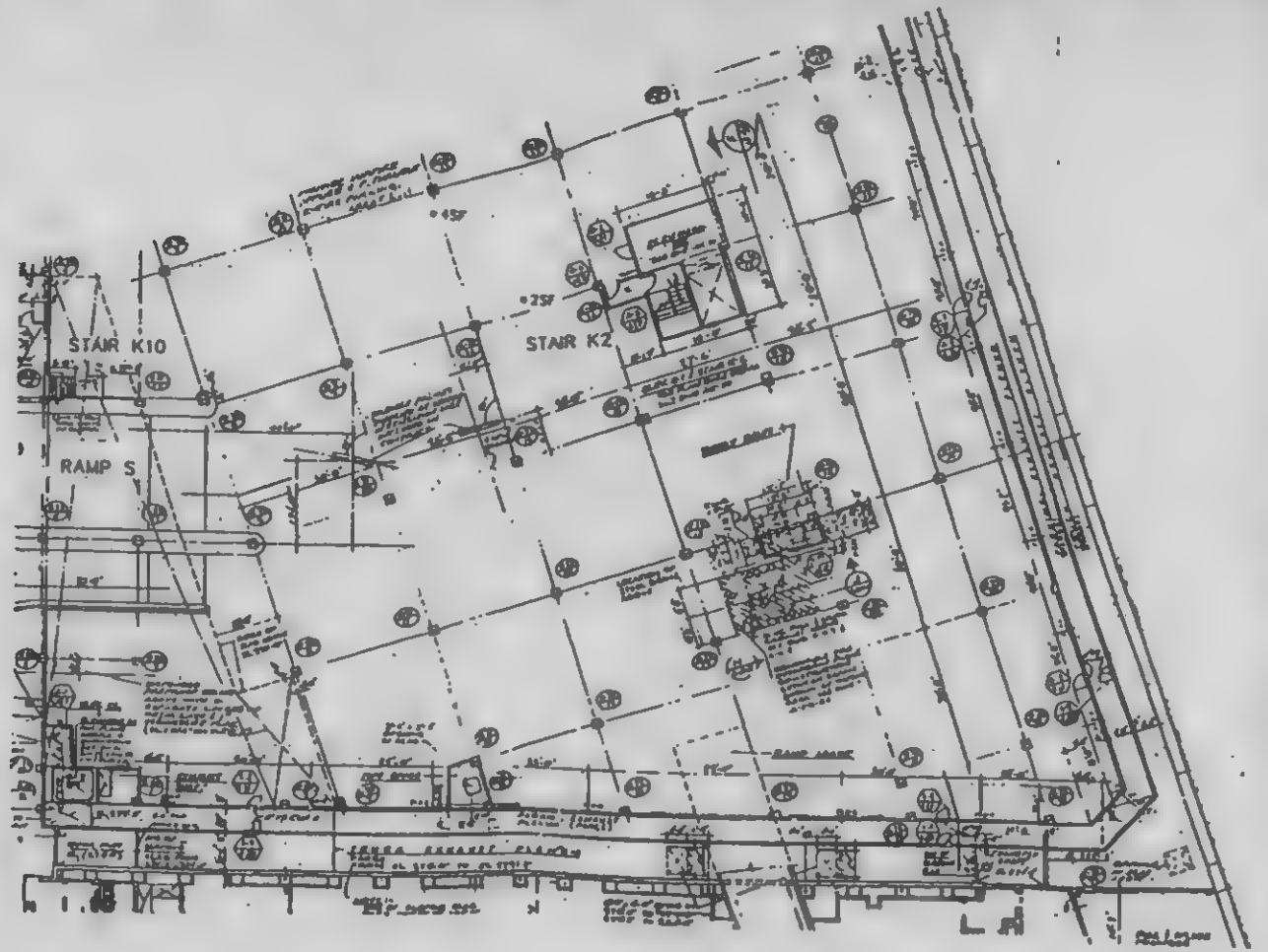

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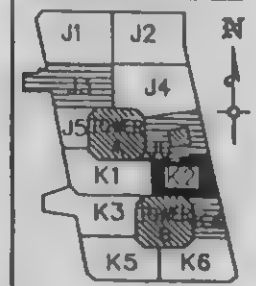

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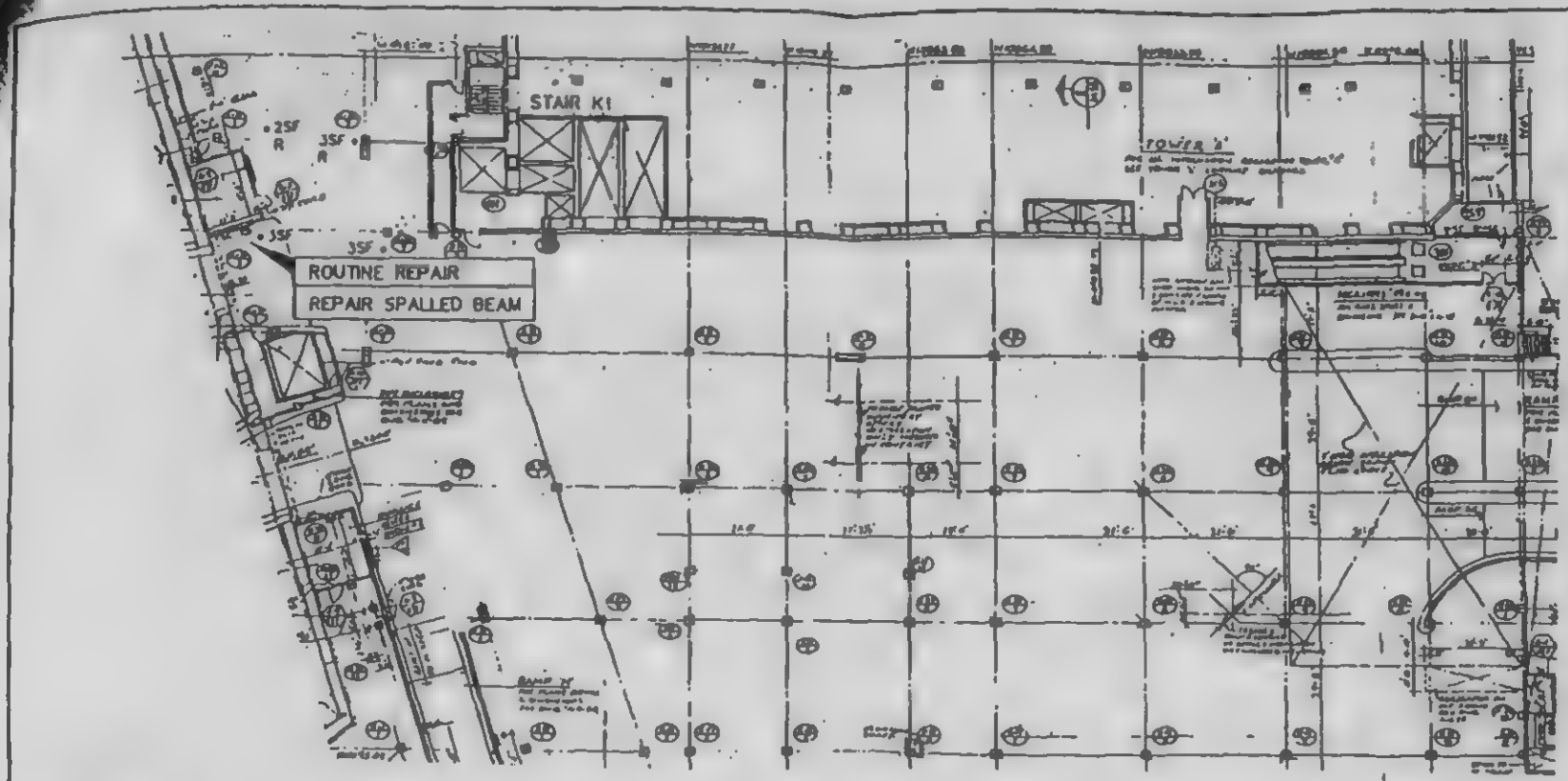

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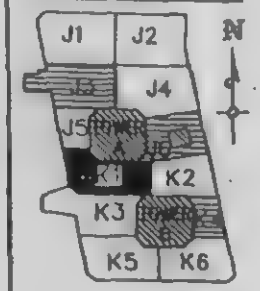

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Quality Assurance Division

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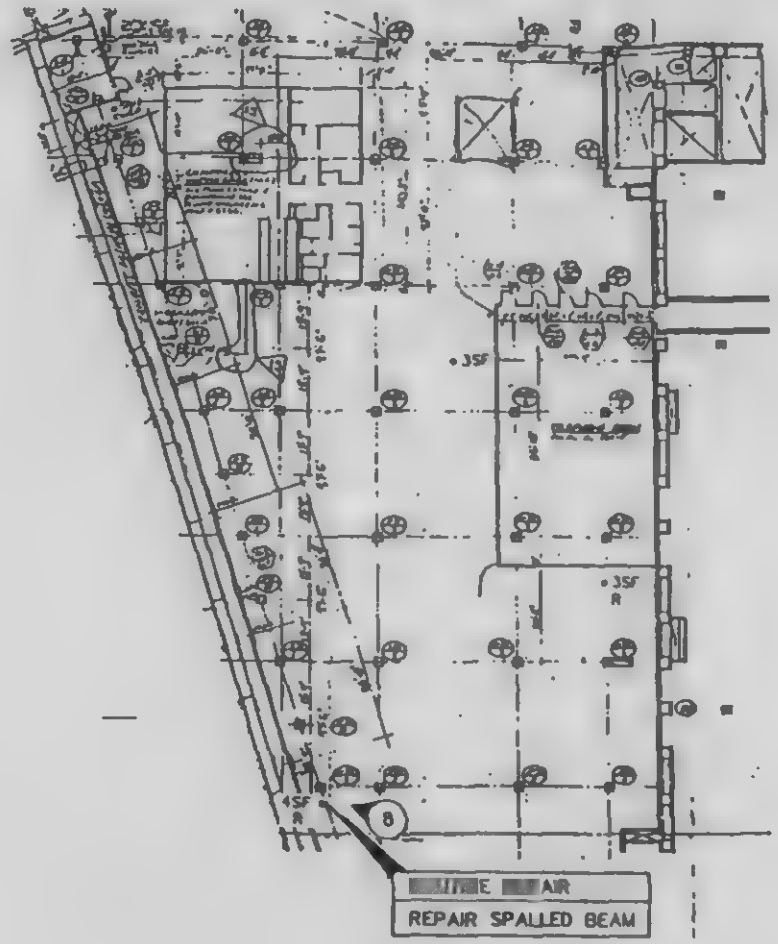

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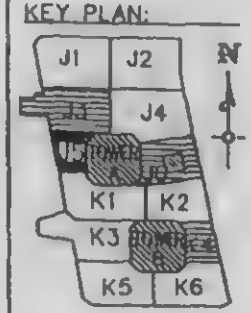

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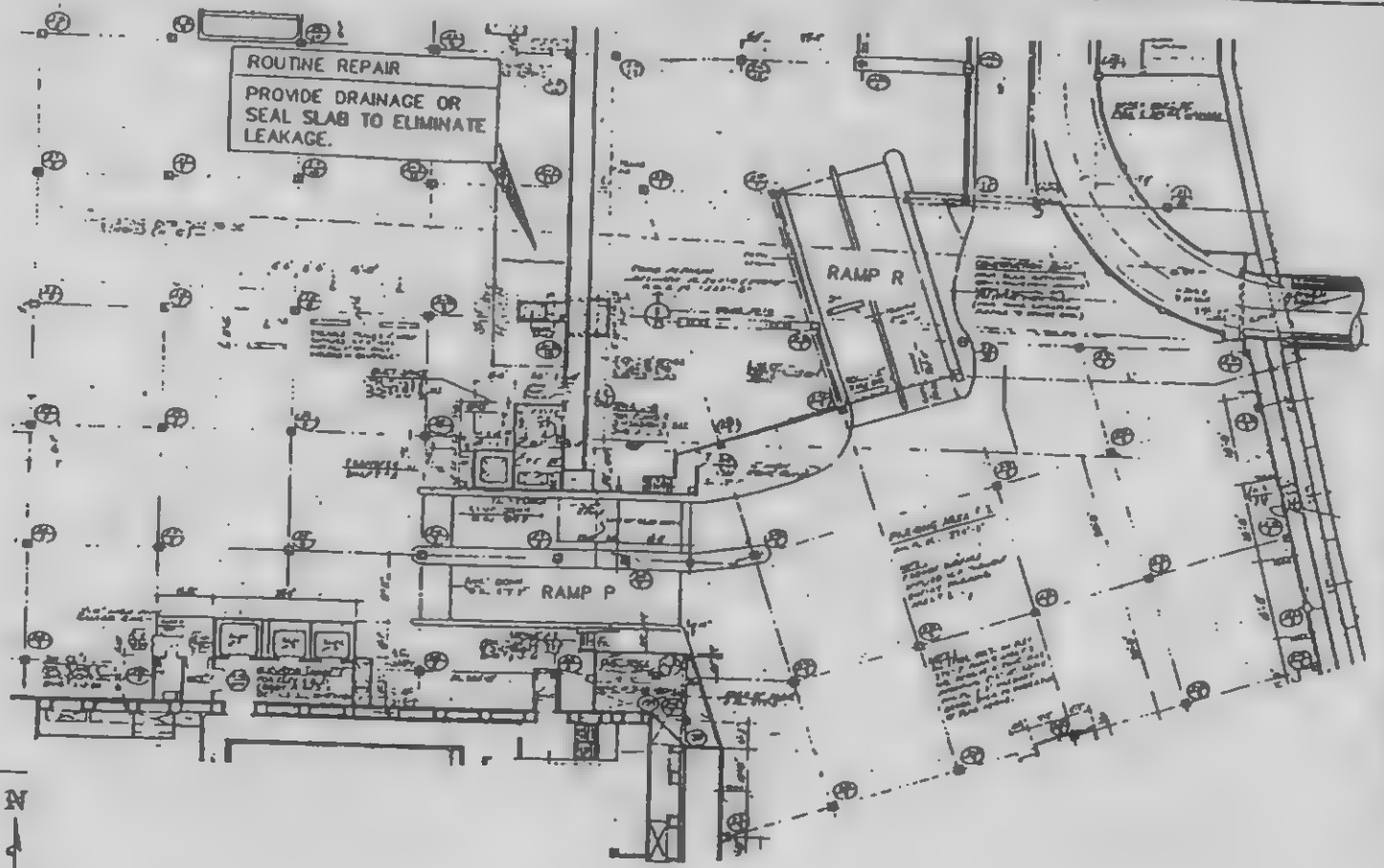

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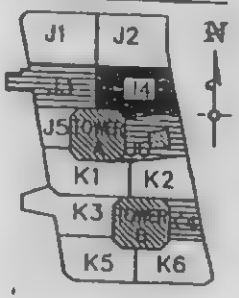

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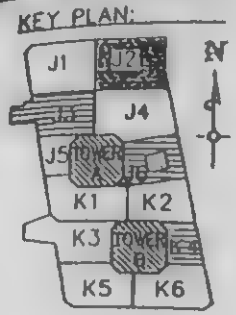

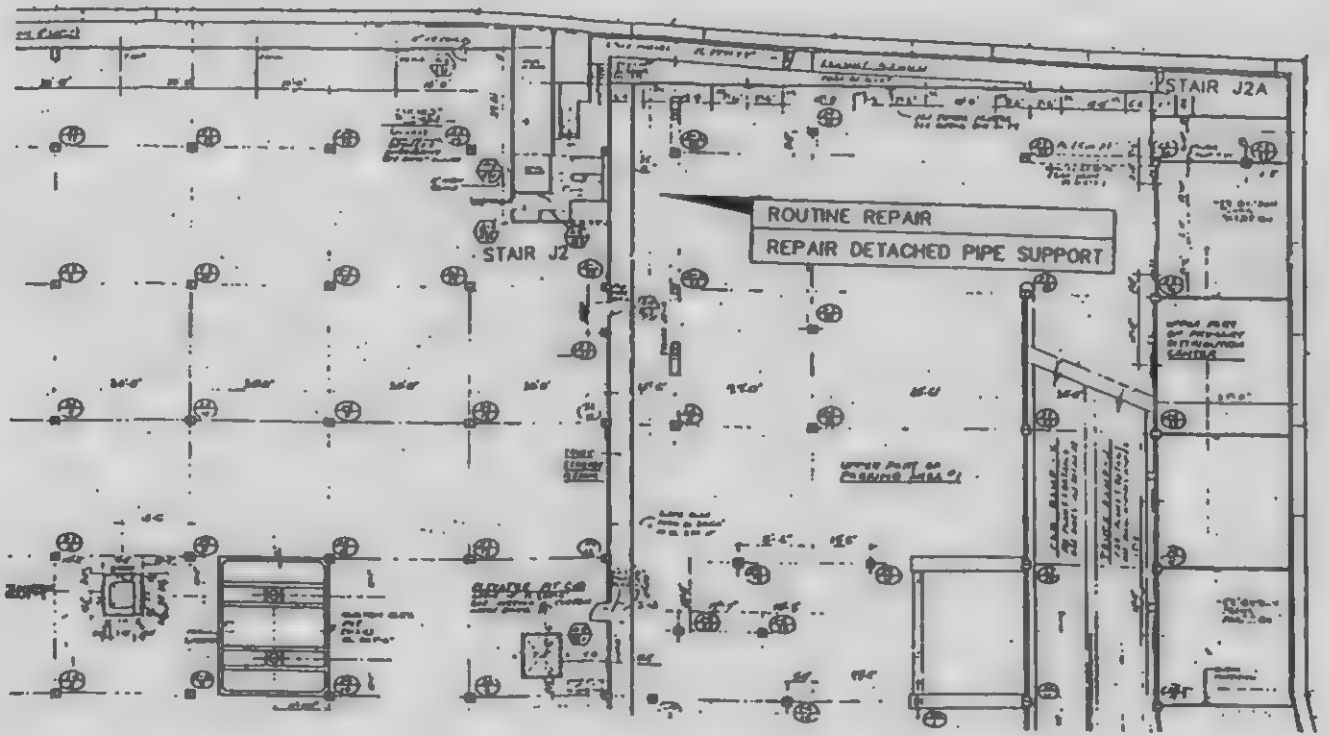

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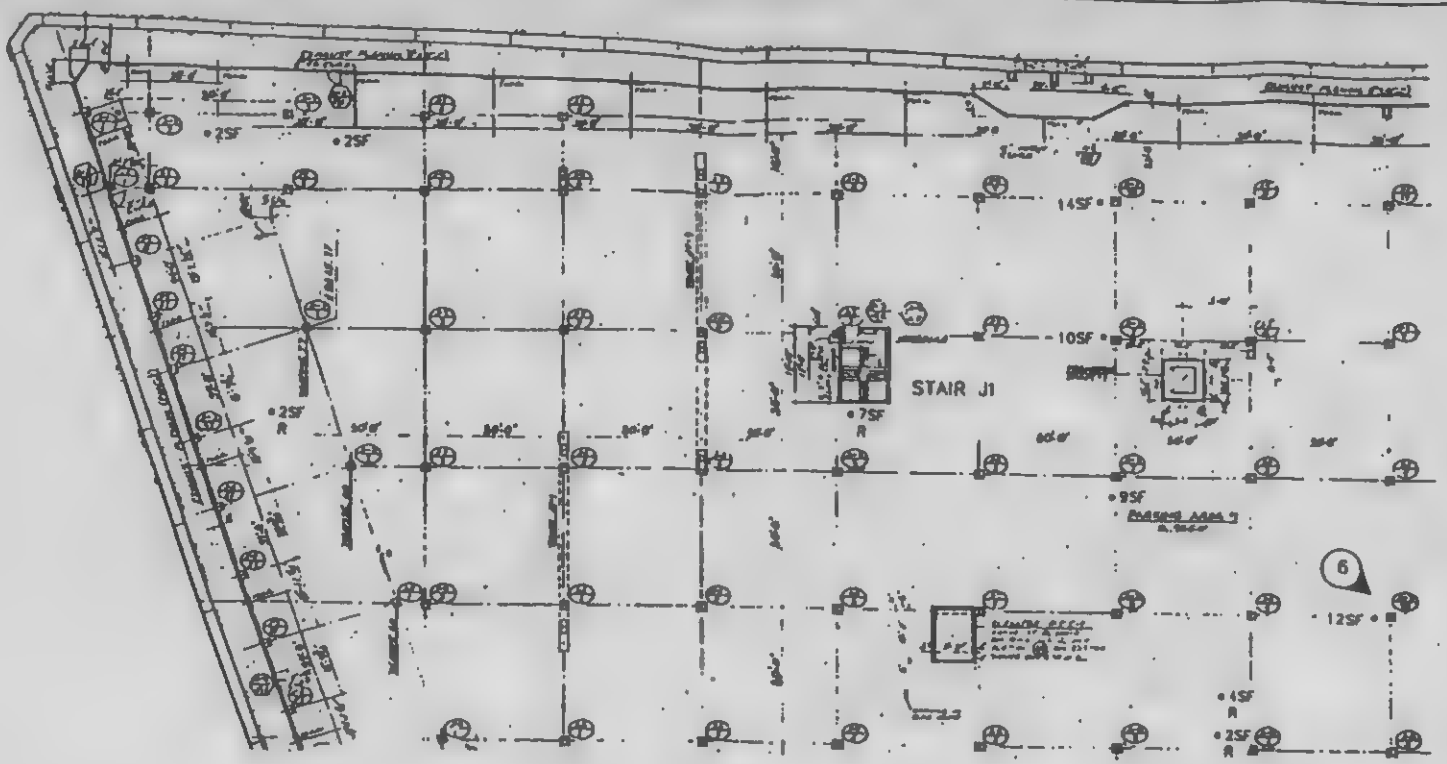

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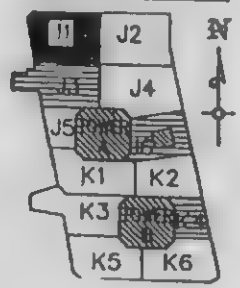

THE PORT AUTHORITY

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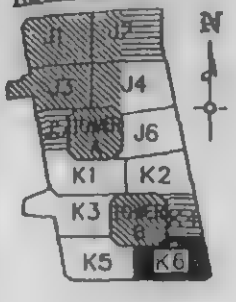

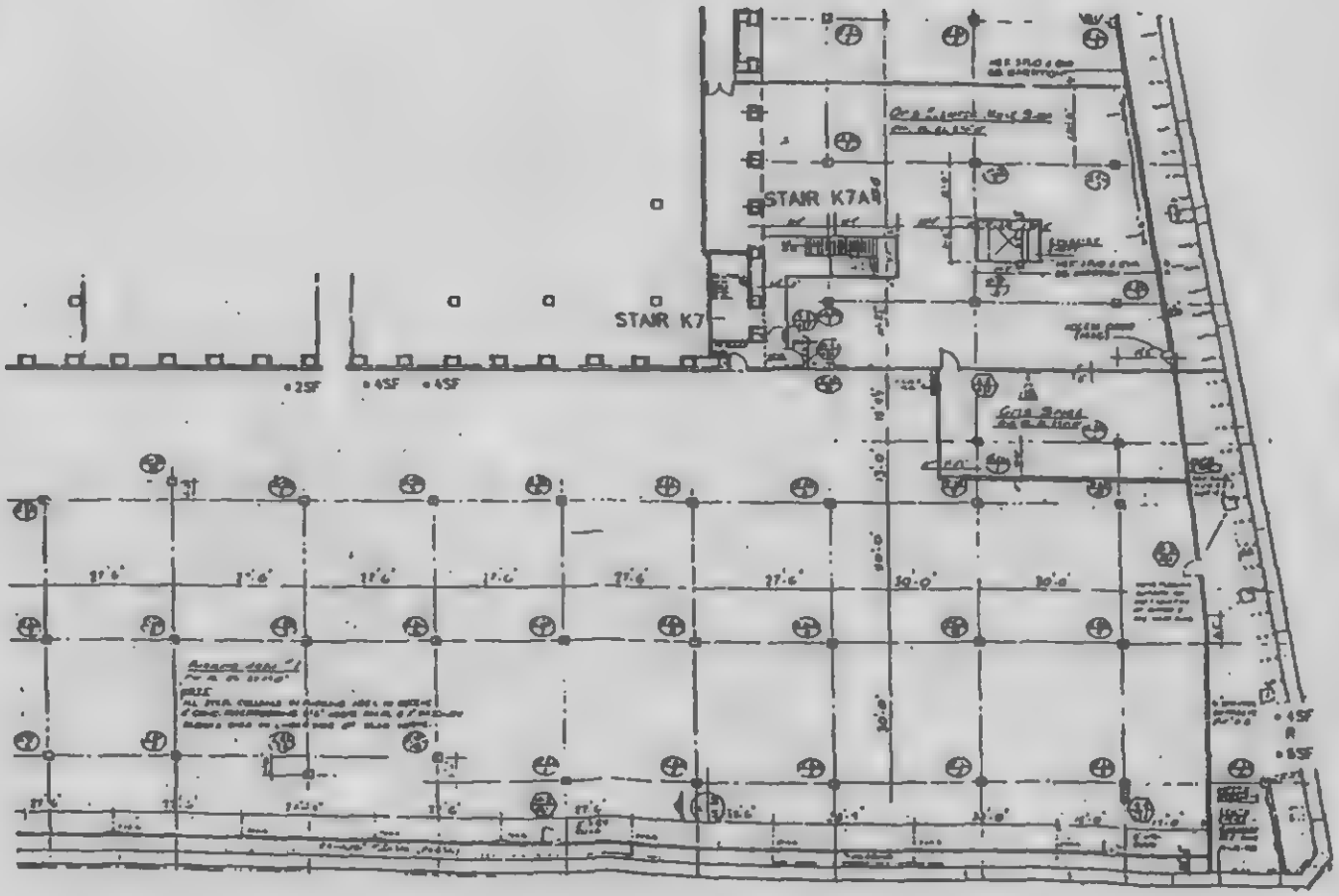

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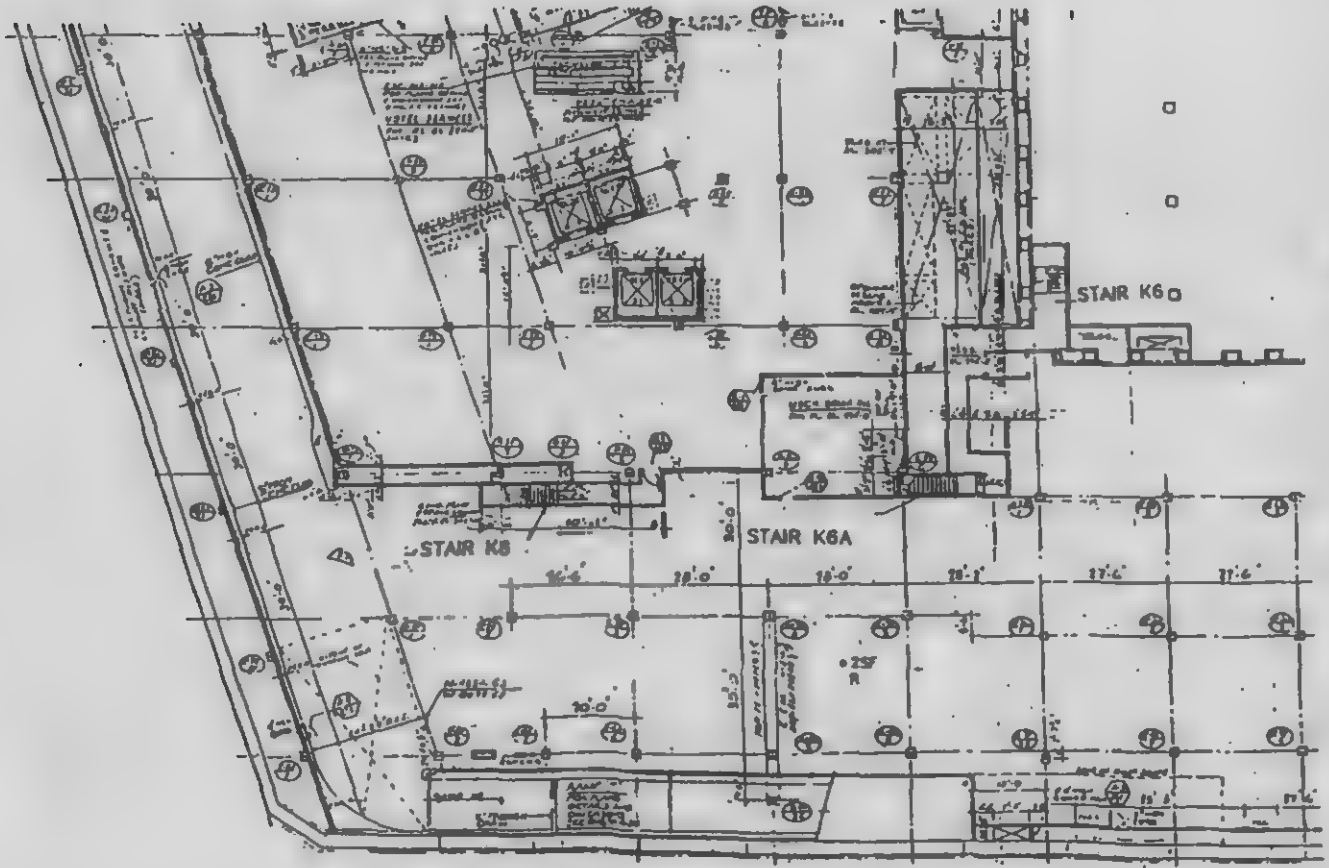

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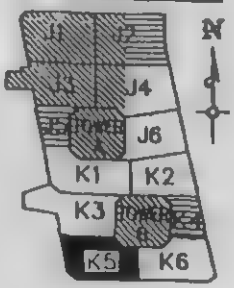

THE PORT AUTHORITY OF NY & NJ

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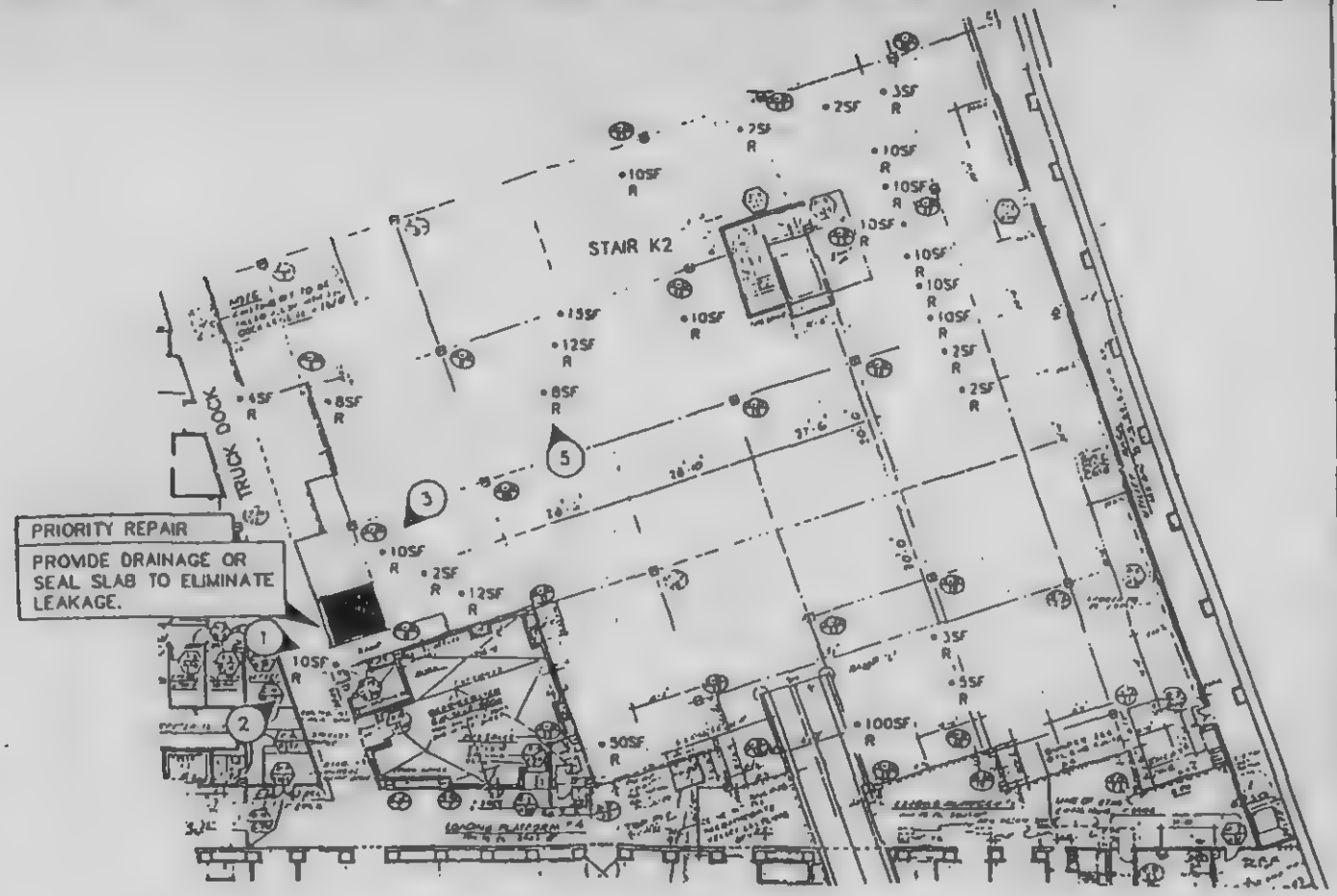

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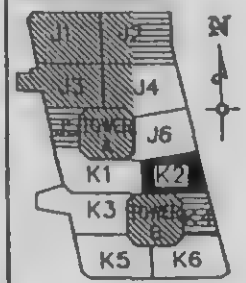

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LEVEL B1
SECTOR K2

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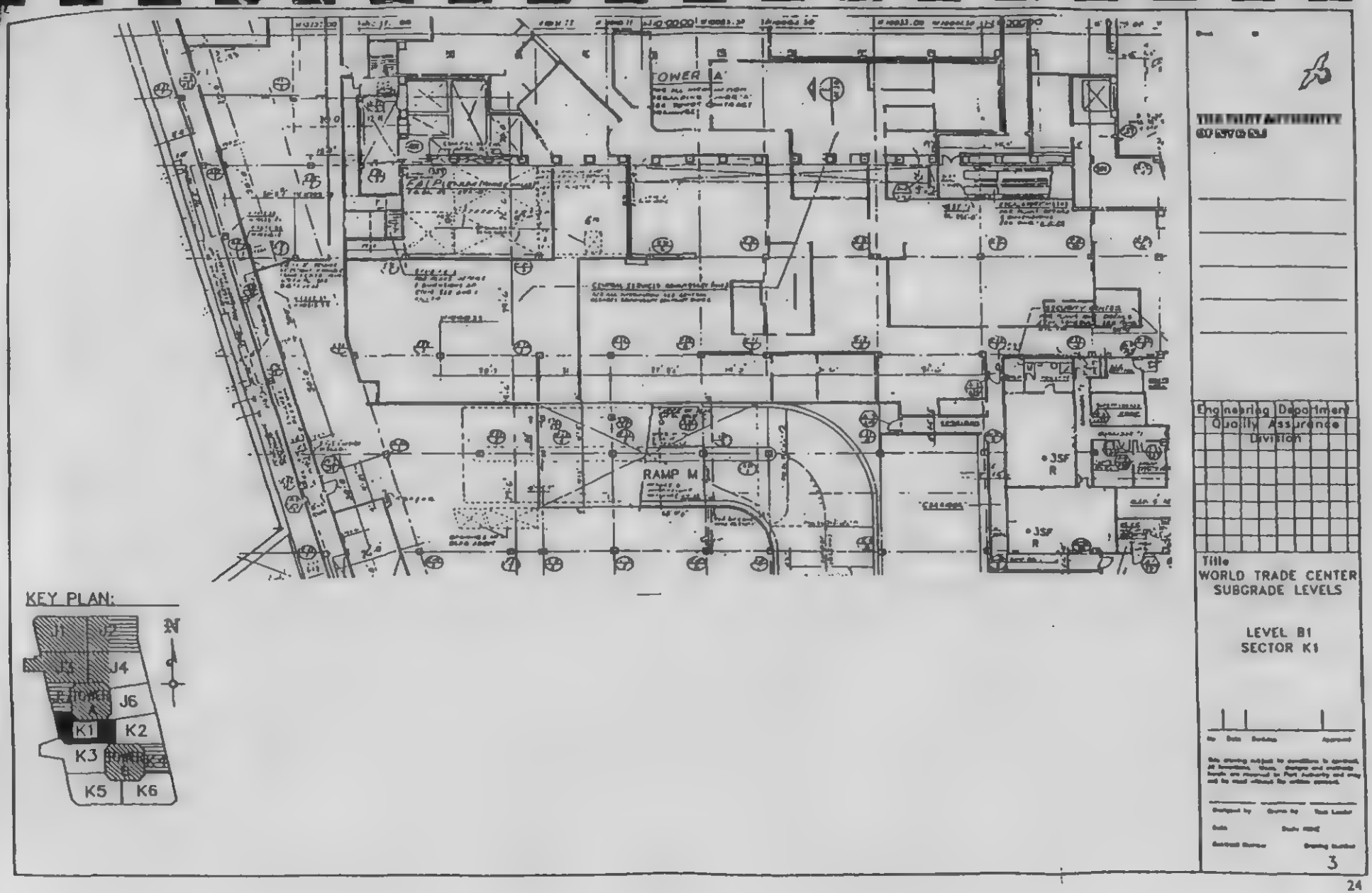
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RAMP M
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J2
J3
J4
J6
K1
K2
K3
K5
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THE PORT AUTHORITY OF NY & NJ
Engineering Department
Quality Assurance Division
Title
WORLD TRADE CENTER
SUBGRADE LEVELS
LEVEL B1
SECTOR K1
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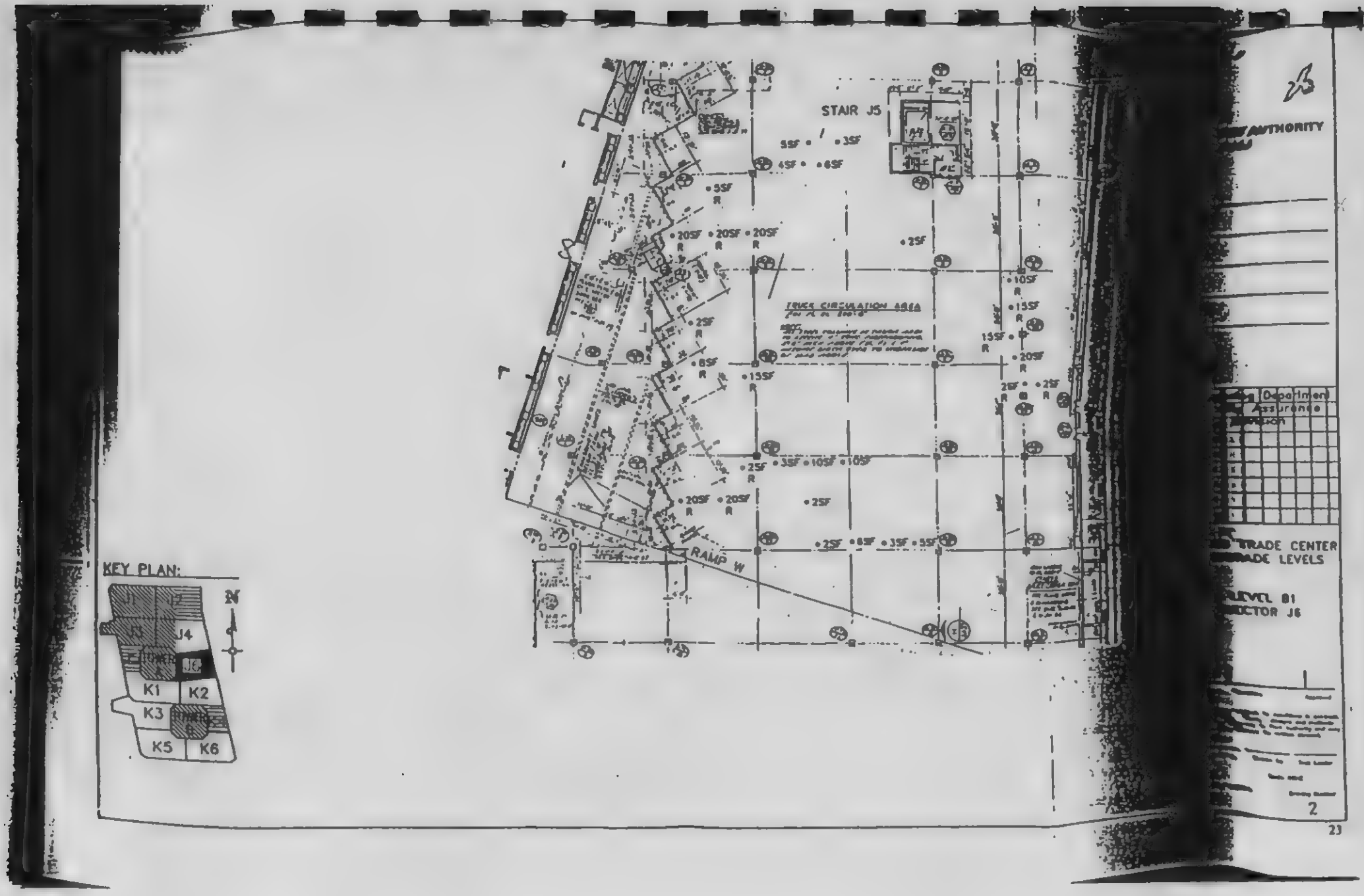
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J2
J3
J4
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K1
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K3
K5
K6
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AUTHORITY
TRADE CENTER
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ATTACHMENT 3

Permit to Reoccupy

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
OFFICE OF THE CHIEF ENGINEER
ONE WORLD TRADE CENTER
NEW YORK, N.Y. 10048

TO: R. E. Catlin, Director, World Trade Department, WTC

PERMIT TO OCCUPY OR USE
OF
WTC-899.802A
Emergency Repairs

Based upon the Statement of Completion issued by E. A. Hauser, Engineer of Construction, under date of April 5, 1997, which states that the work performed by Karl Koch Erecting Co., Inc./Slattery Associates, Inc., A Joint Venture for Emergency Repairs at World Trade Center has been substantially completed, in accordance with the approved Contract Drawings and Specifications and requirements of the Port Authority, so as to permit occupancy or use on October 10, 1997 and the fact that audit of field construction and/or field records made by the Engineering Department during the progress of work under Contract No. WTC-899.802A have not, to the best of my knowledge and belief, disclosed any evidence that the requirements of the approved Contract Drawings and Specifications and requirements of the Port Authority have not been met, I hereby issue a Permit to Occupy or Use.

Francis J. Lombardi, P.E.
Chief Engineer

Dated: October 10, 1997
New York, N.Y.

cc: Benacchio, Castaldo, Chachkes, Chapin, Finnegan, Ginex, Lin, Warren:
File (2)

ATTACHMENT 4

Crandlemere and Associates Asbestos-Containing Materials
Document Review & Evaluation

R. W. CRANDLEMERE & ASSOCIATES, INC.
PROTECTING BUSINESS AND THE ENVIRONMENT

ASBESTOS-CONTAINING MATERIALS

DOCUMENT REVIEW AND EVALUATION

SUBGRADE AREAS

WORLD TRADE CENTER

NEW YORK CITY, NY 10081

Project #000095

Merritt & Harris, Inc. #20-251E

User:

Merritt & Harris, Inc.
Attn: Mr. Robert G. Weiland, V. P.
110 East 42nd Street, 12th Floor
New York City, NY 10017-5685

Date Issued: November 7, 2000

549 Columbian Street, Suite 305, Weymouth, MA 02190 Tel. (781) 340-6161 Fax (781) 340-9191

The Asbestos-Containing Materials Document Review and Evaluation described herein was conducted by the undersigned, of R W Crandlemere & Associates, Inc. (CRANDLEMERE & ASSOCIATES) CRANDLEMERE & ASSOCIATES assessment consisted solely of the activities described in the Introduction of this report. The assessment was conducted in accordance with the Scope of Work in our Proposal No. 00-090. It is subject to the Limitations and Service Constraints as provided in Appendix A of our ASTM Phase I Environmental Site Assessment report prepared as part of this Project. See Appendix F of that report for ASTM definitions of terms in italics in this report.

Report Prepared by:

R. Wayne Crandlemere
President

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1.0 INTRODUCTION

R. W. Crandlemere & Associates, Inc. (CRANDLEMERE & ASSOCIATES) was retained by Merritt & Harris, Inc. (the *user*) to conduct an ASTM E1527-97 Phase I *Environmental Site Assessment* (ESA) of One, Two, Four and Five World Trade Center, located in the Borough of Manhattan, New York City, New York, 10081.

It is our understanding that Merritt & Harris, Inc. is providing this information in conjunction with, and as part of, a larger assessment of the *property* and has named The Port Authority of New York and New Jersey as an *additional user* as defined by the ASTM Standard E1527-97 Section 3.3.39. As an *additional user*, The Port Authority of New York and New Jersey may rely on the information presented in this report.

This report presents CRANDLEMERE & ASSOCIATES' professional opinion, and no warranty, expressed or implied, is made. The Port Authority of New York and New Jersey has the right to reproduce in full and provide copies of this report to interested parties. All reports, both verbal and written, are for the benefit of The Port Authority of New York and New Jersey and its' agents, employees, participates, and assigns.

On September 26, 27, 28 and 29 and October 10 and 11, 2000 Mr. R. Wayne Crandlemere of CRANDLEMERE & ASSOCIATES conducted a *Site visit* to identify *recognized environmental conditions* at the Site. In addition, CRANDLEMERE & ASSOCIATES' assessment included reconnaissance of adjacent properties, background research, and review of available local, state and federal regulatory records regarding the presence of petroleum products or hazardous materials at or in the vicinity of the Site.

The results of our work regarding the ASTM Standard for a Phase I Environmental Site Assessment of the Site is provided in a separate Phase I ESA report.

This report addresses the asbestos-containing materials (ACM) related to the Subgrade areas of the World Trade Center (including parking and storage areas, outside the footprint of One World Trade Center and Two World Trade Center on Levels B-1 to B-6.

See the separate reports specifically related to the One World Trade Center, Two World Trade Center, Four World Trade Center, Five World Trade Center, Retail Mall and Plaza, and Central Services for ACM information specific to those buildings and facility areas.

1.1 Background

The World Trade Center was constructed between 1966 and 1970 when asbestos was used in buildings as a fire retardant. According to the World Trade Center Property Book (see Section 3.4), "sprayed on asbestos is present within the 6th floor catwalks, mezzanine substructure, elevator shafts and machine rooms, interior core pipe chases, and electric and phone closets of the Twin Tower buildings. Additionally, asbestos-containing thermal system pipe insulation is present in pipe chases, the Concourse ceiling plenum and in MERs [mechanical equipment rooms], while vinyl asbestos floor tiles are present

throughout the complex. The Port Authority has removed a large portion of the asbestos material typically located on the structural columns and on pipe insulation from tenant floors in One World Trade Center, and has removed much of the pipe wrap insulation found in the Subgrade. The practice of containment has not been implemented at the World Trade Center."

"In addition to full-scale abatement projects, the World Trade Center has instituted an ongoing operations and maintenance program whereby specific individuals on the staff are trained as certified ACM handlers and can respond with appropriate equipment and procedures to manage incidental ACM incidents. Tenants whose space may contain ACM have been formally notified."

1.2 Scope of Work

Beyond the Scope of Work for the ASTM Standard for a Phase I Environmental Site Assessment, but as required by the *user*, summaries of readily available information (provided by and apparently prepared by the Port Authority of New York and New Jersey) pertaining to the presence of asbestos-containing building materials (ACBM) and documentation of the work done to abate ACBM was evaluated. No sampling or analysis was included and this is not to be interpreted as a complete asbestos survey.

Please note: There is reported litigation in progress for cost-recovery of money related to ACM abatement and/or management. This litigation was not evaluated as part of this assessment and the *user* should consider a detailed review of the on-going litigation and make their own determination as to the impact, if any, on their use of this report and/or future impact of the litigation on their decision making process related to the World Trade Center. Further, the information presented in this report is based at least in part on a somewhat arbitrary separation of areas of the complex that may or may not have any basis in the current operation of the Complex as it is currently managed as one facility. The *user* should consider this report as a good faith effort to present ACM related information to the subject area, however, the *user* is encouraged to review the ACM related Section of the Phase I Environmental Site Assessment (ESA) report which provides a summary of all ACM related information provided by the *owner*. Included in Appendix H-7 of the ESA report are copies of the asbestos program highlights as presented in the World Trade Center Environmental Programs 1999 Year End report. This includes a summary of 1999 Asbestos Projects, World Trade Center Asbestos Disclosure, World Trade Center Elevator Shaft Asbestos Assessment, and World Trade Center Asbestos Contract Administration procedures. Portions of those documents are included in this report. Additionally, the *user* should consider an independent review of the information provided.

It should also be noted that certain materials such as fire doors were not included in the materials suspected to be asbestos-containing and have not been tested or otherwise investigated. It was reported that testing of spline ceilings, hung ceilings, wallboard and wallboard joint compound determined that they were not ACM throughout the facility. A

review of test results was not performed and we cannot verify the adequacy of such testing. The *user* may wish to further investigate such materials.

There have been significant on-going asbestos abatement projects and cost estimates provided by the *owner* indicate the following estimated removal costs:

Material	Removal Cost
Vinyl asbestos tile (VAT)	$ 5-6/square foot
Sprayed-on Fireproofing	$20-25/square foot
Thermal System Insulation (TSI)	$15/linear foot

The actual costs for VAT removal for 1999 projects are provided in Appendix H-7 of the Phase I ESA report.

Documentation regarding the presence of ACM in elevator shafts is presented by shaft designation. It is unclear where the shafts are located within the facility and the *user* should consider cross-referencing the shaft locations to the area under consideration. Mr. Taylor reported that there are forty (40) shafts that contain ACM within the Center.

2.0 SUMMARY OF REVIEW OF DOCUMENTS

Documents reviewed suggest that areas may have vinyl asbestos tile (VAT). Additionally, elevator shafts that may penetrate the area, if any, probably have ACM present.

Information provided reports that there is no asbestos-containing fireproofing in the Subgrade parking areas. Thermal system insulation is present but quantities were not provided. Mr. Phillip Taylor reported that the asbestos-containing fireproofing at the U.S. Customs truck dock has been removed and replaced with non-asbestos fireproofing tinted blue. He reported that some small areas of "spot removal" has occurred and that approximately 5,000 square feet of asbestos-containing fireproofing at the main Port Authority truck dock was "encased" (actually encapsulated) and that the encapsulated fireproofing is tinted "whitish" (Photos #1 & 2). The remainder of the fireproofing (50,000 square feet) at the main truck dock is reported original and to be ACM.

APPENDIX A

THE PORT AUTHORITY OF NY & NJ **MEMORANDUM**

TO: Joseph Amatuccio, Carla Bonacci, Jerrold Dinkels, Frank DiMartini, Eric Hauser, Louis Menno, Edwin Monteverde, Francis Riccardelli, Nancy Seliga

FROM: John Castaldo

DATE: September 19, 2000

SUBJECT: **ASBESTOS POSITIVE LOCATIONS AT THE WORLD TRADE CENTER: UPDATE.**

REFERENCE: J. Castaldo to Addressees; Memorandums Dated 5/4/98 and 12/21/99; Same Subject.

COPY: L. Ardizzone, S. Benjamin, I. Chachkes, J. Connors, W. Devlin, M. Finegold, M. Hurley, M. Jakubek, M. Kirshner, T. Lynch, U. Mehta, G. Meyer, R. Muessig, C. Nanninga, A. Reiss, E. Strauss, G. Tabek, P. Taylor, F. Varriano, L. Zucchi, Operations Control Desk, S-4's

Attached please find an update to my initial May, 1998 memorandum wherein the known asbestos locations at the World Trade Center were disclosed. The information provided in this disclosure is a compulation of avaliable bulk sampling and analytical results from both the World Trade and Engineering Departments' data bases.

In compliance with the disclosure requirements of the U.S. Occupational Safety and Health Administration's asbestos standard, I am requesting that this information be distributed to all World Trade Department, Engineering Department, PA Office Space, and Leasing Division property managers, project managers, construction managers, construction inspectors, operations supervisors, security supervisors, facility maintanence supervisors, and leasing agents associated with the allocation of space, and the design and implementation of World Trade Center projects. Additionally, please forward this information to those contractors under your administration. If there are questions as to the presence of asbestos-containing materials at a particular location, or if the scope of demolition and/or renovation work may impact asbestos-containing materials, please contact Art Burton, Assistant Environmental Coordinator, at 435-8364.

Those on the copyline are requested to contact this office for the appropriate response action if asbestos-containing materials may be impacted by work under your jurisdiction. The Port Authority complies with Industrial Code Rule #56 relative to worker certifications, contractor licensing, and work procedures if asbestos is going to be disturbed or impacted. Please contact me at 435-8518 should you have any questions.

John Castaldo
General Manager,
Base Building Services

Asbestos-Containing Surfacing And/Or Thermal System Insulation Materials Located In Four And Five World Trade Center

There is no asbestos-containing sprayed-on fireproofing in Four and Five World Trade Center.
A cementitious patch has been identified on a beam in the south wing of the southwest portion on the 5th floor in 5 WTC.
Thermal system insulation is present in the form of pipe saddles.

Asbestos-Containing Surfacing And/Or Thermal System Insulation Materials Located On The Concourse

There is no asbestos-containing sprayed-on fireproofing in the plenum of the Concourse.
Thermal system insulation material is present.
ACM

Asbestos-Containing Surfacing And/Or Thermal System Insulation Materials Located On The B1 Level And The Truckdock

Asbestos-containing sprayed-on fireproofing and thermal system insulation material is present.

Miscellaneous Asbestos-Containing Materials At The World Trade Center

Base building flooring throughout the facility is vinyl asbestos floor tile (VAT).

1, 2, 4, and 5 WTC

SUBGRADES and TRUCKDOCK

Subgrades -

1 WTC:

B1 Level – Core, and N/E Quadrant	5,000 sqft / No TSI
B6 Level – Entire Level	40,000 sqft / No TSI
TOTAL:	45,000 sqft / No TSI

2, 4, and 5 WTC: No ACM

Truckdock -

Main Truckdock	50,000 sqft

Asbestos-Containing Surfacing And Thermal System Insulation Materials Located In Four And Five World Trade Center

There is no asbestos-containing sprayed-on fireproofing in Four and Five World Trade Center.
Thermal system insulation is present in the form of pipe saddles.

Asbestos-Containing Surfacing And Thermal System Insulation Materials Located On The Concourse

There is no asbestos-containing sprayed-on fireproofing in the plenum of the Concourse.
There is thermal system insulation material present.
ACM

Asbestos-Containing Surfacing And Thermal System Insulation Materials Located On The B1 Level And The Truckdock

Asbestos-containing sprayed-on fireproofing and thermal system insulation material is present.

Miscellaneous Asbestos-Containing Materials At The World Trade Center

Base building flooring throughout the facility is vinyl asbestos floor tile (VAT).

ACBM is located behind the convector units at the following locations:
1 WTC; 77, 79, 88, 101, 103 and 105.
2 WTC; 22, 24, 59, 72, 79, 81, 84, 86 and 87.

THE PORT AUTHORITY OF NEW YORK & NEW JERSEY

MEMORANDUM

TO: Phil Taylor-Supervising Engineer.

FROM: Pete Negron

DATE: July 21, 1999

SUBJECT: **Elevator Shaft Asbestos Assessment.**

REFERENCE: **Attached E-Mail**

COPY TO: J. Amatuccio, D. Bobbitt, A. Burton, J. Castaldo, F. Riccardelli, L. Zucchi.

During the week of July 21, 1999, I inspected the elevator shafts to assess the condition of the fireproofing on the steel members.

The attached report includes the shaft number, floor and condition of fireproofing: intact or delaminated, and recommended action.

Floors not listed were inspected and found to be acceptable in that the fireproofing was intact.

In summary, of the 22 shafts inspected, shafts, which require full-scale abatement, are shafts 22/23A, 10B and 48B.

If you require further information regarding this report please contact me at 1.212.435.8364.

Pete Negron
Associate Environmental Analyst
Operations & Maintenance Management
World Trade Center

Attachment

WORLD TRADE CENTER
ELEVATOR SHAFTS ASBESTOS ASSESSMENT

FLOOR	SHAFT	FIREPROOFING INTACT	DELAMINATION	QUANTITY DELAMINATED	RECOMMENDATION
25	1A	NO	YES	24 S.F.	SEAL EDGES
26	1A	NO	YES	12 S.F.	SEAL EDGES
27	1A	NO	YES	30 S.F.	SEAL EDGES
28	1A	NO	YES	12 S.F.	SEAL EDGES
29	1A	NO	YES	48 S.F.	SEAL EDGES
SPRAY-ON MATERIAL					

FLOOR	SHAFT	FIREPROOFING INTACT	DELAMINATION	QUANTITY DELAMINATED	RECOMMENDATION
9	2A	NO	YES	24 S.F.	SEAL EDGES
27	2A	NO	YES	4 S.F.	SEAL EDGES
28	2A	NO	YES	4 S.F.	SEAL EDGES
29	2A	NO	YES	4 S.F.	SEAL EDGES
30	2A	NO	YES	24 S.F.	SEAL EDGES
31	2A	NO	YES	24 S.F.	SEAL EDGES
34	2A	NO	YES	36 S.F.	SEAL EDGES
38	2A	NO	YES	6 S.F.	SEAL EDGES
SPRAY-ON MATERIAL					

2A

FLOOR	SHAFT	FIREPROOFING INTACT	DELAMINATION	QUANTITY DELAMINATED	RECOMMENDATION
310	3A	NO	YES	72 S F.	SEAL EDGES
5	3A	NO	YES	34 S.F.	SEAL EDGES
8	3A	NO	YES	48 S.F.	SEAL EDGES
9	3A	NO	YES	48 S.F.	SEAL EDGES
16	3A	NO	YES	30 S.F.	SEAL EDGES
17	3A	NO	YES	48 S.F.	SEAL EDGES
18	3A	NO	YES	48 S F.	SEAL EDGES
19	3A	NO	YES	72 S F.	SEAL EDGES
28	3A	NO	YES	48 S F.	SEAL EDGES
34	3A	NO	YES	72 S F.	SEAL EDGES
40	3A	NO	YES	6 S F.	SEAL EDGES
SPRAYED-ON MATERIAL					

FLOOR	SHAFT	FIREPROOFING INTACT	DELAMINATION	QUANTITY DELAMINATED	RECOMMENDATION
ALL	4A	YES	NO	NONR	NONE
CEMENTITIOUS MATERIAL					

FLOOR	SHAFT	FIREPROOFING INTACT	DELAMINATION	QUANTITY DELAMINATED	RECOMMENDATION
ALL	5A	YES	NO	NONE	NONE
ALL	48A	YES	NO	NONE	NONE
CEMENTITIOS MATERIAL					

Note Delamination is fireproofing whether sprayed or troweled no longer present on the steel members

WORLD TRADE CENTER
ELEVATOR SHAFTS ASBESTOS ASSESSMENT

FLOOR	SHAFT	FIREPROOFING INTACT	DELAMINATION	QUANTITY DELAMINATED	RECOMMENDATION
22	8A	NO	YES	72 S.F.	SEAL EDGES
33	8A	NO	YES	48 S.F.	SEAL EDGES
36	8A	NO	YES	4 S.F.	SEAL EDGES
38	8A	NO	YES	48 S.F.	SEAL EDGES
39	8A	NO	YES	48 S.F.	SEAL EDGES
SPRAY-ON MATERIAL					

FLOOR	SHAFT	FIREPROOFING INTACT	DELAMINATION	QUANTITY DELAMINATED	RECOMMENDATION
7	9A	NO	YES	2 S.F.	SEAL EDGES
13	9A	NO	YES	2 S.F.	SEAL EDGES
24	9A	NO	YES	3 S.F.	SEAL EDGES
31	9A	NO	YES	4 S.F.	SEAL EDGES
34	9A	NO	YES	6 S.F.	SEAL EDGES
36	9A	NO	YES	6 S.F.	SEAL EDGES
39	9A	NO	YES	48 S.F.	SEAL EDGES
41	9A	NO	YES	48 S.F.	SEAL EDGES
43	9A	NO	YES	48 S.F.	SEAL EDGES
SPRAYED-ON MATERIAL					

FLOOR	SHAFT	FIREPROOFING INTACT	DELAMINATION	QUANTITY DELAMINATED	RECOMMENDATION
9	16A	NO	YES	24 S.F.	SEAL EDGES
25	16A	NO	YES	18 S.F.	SEAL EDGES
26	16A	NO	YES	28 S.F.	SEAL EDGES
27	16A	NO	YES	48 S.F.	SEAL EDGES
28	16A	NO	YES	24 S.F.	SEAL EDGES
CEMENTITIUOS MATERIAL					

FLOORS	SHAFT	FIREPROOFING INTACT	DELAMINATION	QUANTITY DELAMINATED	RECOMMENDATION
ALL	17A	YES	NO	NO	NONE

FLOORS	SHAFT	FIREPROOFING INTACT	DELAMINATION	QUANTITY DELAMINATED	RECOMMENDATION
ALL	18A	X	NO	NONE	NONE

Note Delamination is fireproofing whether sprayed or troweled no longer present on the steel members

WORLD TRADE CENTER
ELEVATOR SHAFTS ASBESTOS ASSESSMENT

FLOOR	SHAFT 1 WTC	FIREPROOFING INTACT	DELAMINATION	QUANTITY DELAMINATED	RECOMMENDATION
8	19A	NO	YES	16 S.F.	SEAL EDGES
10	19A	NO	YES	24 S.F.	SEAL EDGES
11	19A	NO	YES	24 S.F.	SEAL EDGES
19	19A	NO	YES	48 S.F.	SEAL EDGES
25	19A	NO	YES	48 S.F.	SEAL EDGES
26	19A	NO	YES	48 S.F.	SEAL EDGES
28	19A	NO	YES	24 S.F.	SEAL EDGES
30	19A	NO	YES	24 S.F.	SEAL EDGES
32	19A	NO	YES	2 S.F.	SEAL EDGES
CEMENTITIOUS MATERIAL					

FLOOR	SHAFT	FIREPROOFING INTACT	DELAMINATION	QUANTITY DELAMINATED	RECOMMENDATION
8	20A	NO	YES	12 S.F.	SEAL EDGES
10	20A	NO	YES	3 S.F.	SEAL EDGES
22	20A	NO	YES	3 S.F.	SEAL EDGES
23	20A	NO	YES	3 S.F.	SEAL EDGES
25	20A	NO	YES	36 S.F.	SEAL EDGES
26	20A	NO	YES	34 S.F	SEAL EDGES
27	20A	NO	YES	26 S.F.	SEAL EDGES
28	20A	NO	YES	30 S.F.	SEAL EDGES
29	20A	NO	YES	28 S.F.	SEAL EDGES
SPRAYED-ON MATERIAL					

FLOOR	SHAFT	FIREPROOFING INTACT	DELAMINATION	QUANTITY DELAMINATED	RECOMMENDATION
310	21A	NO	YES	24 S.F.	SEAL EDGES
2	21A	NO	YES	24 S.F.	SEAL EDGES
3	21A	NO	YES	24 S F.	SEAL EDGES
5	21A	NO	YES	24 S.F.	SEAL EDGES
23	21A	NO	YES	24 S F.	SEAL EDGES
29	21A	NO	YES	48 S F.	SEAL EDGES
32	21A	NO	YES	6 S F	SEAL EDGES
SPRAYED-ON MATERIAL					

Note Delamination is fireproofing whether sprayed or troweled no longer present on the steel members

WORLD TRADE CENTER
ELEVATOR SHAFTS ASBESTOS ASSESSMENT

FLOOR	SHAFT	FIREPROOFING INTACT	DELAMINATION	QUANTITY DELAMINATED	RECOMMENDATION
3	22A	NO	YES	4 S.F.	SEAL EDGES
4	22A	NO	YES	4 S.F.	SEAL EDGES
5	22A	NO	YES	4 S.F.	SEAL EDGES
6	22A	NO	YES	4 S.F.	SEAL EDGES
7	22A	NO	YES	4 S.F.	SEAL EDGES
8	22A	NO	YES	4 S.F.	SEAL EDGES
9	22A	NO	YES	4 S.F.	SEAL EDGES
10	22A	NO	YES	4 S.F.	SEAL EDGES
11	22A	NO	YES	4 S.F.	SEAL EDGES
12	22A	NO	YES	4 S.F.	SEAL EDGES
13	22A	NO	YES	4 S.F.	SEAL EDGES
14	22A	NO	YES	6 S.F.	SEAL EDGES
15	22A	NO	YES	4 S.F.	SEAL EDGES
16	22A	NO	YES	12 S.F.	SEAL EDGES
18	22A	NO	YES	6 S.F.	SEAL EDGES
19	22A	NO	YES	6 S.F.	SEAL EDGES
20	22A	NO	YES	6 S.F.	SEAL EDGES
21	22A	NO	YES	6 S.F.	SEAL EDGES
22	22A	NO	YES	6 S.F.	SEAL EDGES
23	22A	NO	YES	6 S.F.	SEAL EDGES
24	22A	NO	YES	6 S.F.	SEAL EDGES
25	22A	NO	YES	6 S.F.	SEAL EDGES
26	22A	NO	YES	8 S F.	SEAL EDGES
27	22A	NO	YES	6 S F.	SEAL EDGES
28	22A	NO	YES	48 S F.	SEAL EDGES
29	22A	NO	YES	6 S F	SEAL EDGES
30	22A	NO	YES	6 S.F.	SEAL EDGES
31	22A	NO	YES	6 S F.	SEAL EDGES
32	22A	NO	YES	6 S.F.	SEAL EDGES
33	22A	NO	YES	6 S.F.	SEAL EDGES
34	22A	NO	YES	6 S.F.	SEAL EDGES
35	22A	NO	YES	4 S F.	SEAL EDGES
36	22A	NO	YES	8 S F	SEAL EDGES
37	22A	NO	YES	6 S F	SEAL EDGES
38	22A	NO	YES	6 S F.	SEAL EDGES
39	22A	NO	YES	24 S F	SEAL EDGES
40	22A	NO	YES	8 S F.	SEAL EDGES
41	22A	NO	YES	8 S F	SEAL EDGES
42	22A	NO	YES	8 S F.	SEAL EDGES
43	22A	NO	YES	8 S F.	SEAL EDGES
44	22A	NO	YES	8 S F.	SEAL EDGES
45	22A	NO	YES	8 S F.	SEAL EDGES
46	22A	NO	YES	8 S F.	SEAL EDGES
47	22A	NO	YES	8 S.F.	SEAL EDGES
48	22A	NO	YES	2 S F.	SEAL EDGES
49	22A	NO	YES	6 S F.	SEAL EDGES
50	22A	NO	YES	2 S F.	SEAL EDGES
51	22A	NO	YES	4 S F.	SEAL EDGES
52	22A	NO	YES	4 S F.	SEAL EDGES
54	22A	NO	YES	4 S F.	SEAL EDGES
55	22A	NO	YES	2 S F.	SEAL EDGES
56	22A	NO	YES	48 S.F.	SEAL EDGES
58	22A	NO	YES	3 S F.	SEAL EDGES
62	22A	NO	YES	2 S F.	SEAL EDGES
64	22A	NO	YES	2 S F.	SEAL EDGES
67	22A	NO	YES	2 S F.	SEAL EDGES

Note Delamination is fireproofing whether sprayed or troweled no longer present on the steel members

WORLD TRADE CENTER
ELEVATOR SHAFTS ASBESTOS ASSESSMENT

FLOOR	SHAFT	FIREPROOFING INTACT	DELAMINATION	QUANTITY DELAMINATED	RECOMMENDATION
70	22A	NO	YES	3 S.F.	SEAL EDGES
73	22A	NO	YES	2 S.F.	SEAL EDGES
78	22A	NO	YES	2 S.F.	SEAL EDGES
SPRAYED-ON MATERIAL			ABATEMENT OF SHAFT IS RECOMMENDED		

FLOOR	SHAFT	FIREPROOFING INTACT	DELAMINATION	QUANTITY DELAMINATED	RECOMMENDATION
16	23A	NO	YES	2 S.F.	SEAL EDGES
17	23A	NO	YES	2 S.F.	SEAL EDGES
18	23A	NO	YES	2 S.F.	SEAL EDGES
19	23A	NO	YES	2 S.F.	SEAL EDGES
20	23A	NO	YES	2 S.F.	SEAL EDGES
21	23A	NO	YES	2 S.F.	SEAL EDGES
22	23A	NO	YES	2 S.F.	SEAL EDGES
23	23A	NO	YES	2 S.F.	SEAL EDGES
24	23A	NO	YES	2 S.F.	SEAL EDGES
25	23A	NO	YES	2 S.F.	SEAL EDGES
26	23A	NO	YES	2 S.F.	SEAL EDGES
27	23A	NO	YES	2 S.F.	SEAL EDGES
28	23A	NO	YES	2 S.F.	SEAL EDGES
29	23A	NO	YES	2 S.F.	SEAL EDGES
30	23A	NO	YES	2 S.F	SEAL EDGES
31	23A	NO	YES	2 S.F.	SEAL EDGES
32	23A	NO	YES	2 S.F.	SEAL EDGES
33	23A	NO	YES	2 S.F.	SEAL EDGES
34	23A	NO	YES	2 S.F.	SEAL EDGES
35	23A	NO	YES	2 S.F.	SEAL EDGES
36	23A	NO	YES	2 S.F.	SEAL EDGES
37	23A	NO	YES	2 S.F.	SEAL EDGES
73	23A	NO	YES	1 S.F.	SEAL EDGES
SPRAYED-ON MATERIAL			ABATEMENT OF SHAFT IS RECOMMENDED		

Note Delamination is fireproofing whether sprayed or troweled no longer present on the steel members.

1 C

WORLD TRADE CENTER
ELEVATOR SHAFTS ASBESTOS ASSESSMENT

FLOOR	SHAFT	FIREPROOFING INTACT	DELAMINATION	QUANTITY DELAMINATED	RECOMMENDATION
3	10B	NO	YES	6 S.F.	SEAL EDGES
4	10B	NO	YES	6 S.F.	SEAL EDGES
7	10B	NO	YES	8 S.F.	SEAL EDGES
12	10B	NO	YES	1 S.F.	SEAL EDGES
15	10B	NO	YES	2 S.F.	SEAL EDGES
19	10B	NO	YES	20 S.F	SEAL EDGES
20	10B	NO	YES	15 S.F.	SEAL EDGES
21	10B	NO	YES	26 S.F.	SEAL EDGES
22	10B	NO	YES	28 S.F.	SEAL EDGES
23	10B	NO	YES	15 S.F.	SEAL EDGES
25	10B	NO	YES	48 S.F.	SEAL EDGES
28	10B	NO	YES	4 S.F.	SEAL EDGES
29	10B	NO	YES	2 S.F.	SEAL EDGES
31	10B	NO	YES	2 S.F.	SEAL EDGES
34	10B	NO	YES	48 S.F.	SEAL EDGES
35	10B	NO	YES	48 S.F.	SEAL EDGES
36	10B	NO	YES	34 S.F.	SEAL EDGES
37	10B	NO	YES	24 S.F.	SEAL EDGES
39	10B	NO	YES	48 S.F.	SEAL EDGES
40	10B	NO	YES	48 S.F.	SEAL EDGES

SPRAYED-ON MATERIAL — ABATEMENT OF SHAFT IS RECOMMENDED

FLOOR	SHAFT	FIREPROOFING INTACT	DELAMINATION	QUANTITY DELAMINATED	RECOMMENDATION
5	11B	NO	YES	1 S.F.	SEAL EDGES
12	11B	NO	YES	1 S.F.	SEAL EDGES
19	11B	NO	YES	2 S.F.	SEAL EDGES
26	11B	NO	YES	2 S F	SEAL EDGES
31	11B	NO	YES	48 S F.	SEAL EDGES
33	11B	NO	YES	2 S F.	SEAL EDGES
40	11B	NO	YES	2 S F.	SEAL EDGES

SPRAYED-ON MATERIAL

FLOOR	SHAFT	FIREPROOFING INTACT	DELAMINATION	QUANTITY DELAMINATED	RECOMMENDATION
ALL	5B	YES	NO	NONE	NONE
ALL	48B*	NO	YES	***	ABATEMENT

48B SHAFT-SPRAYED-ON FIREPROOFING

*** 1' - FOOT STRIP ALONG LENGTH OF COLUMN MISSING

Note Delamination is fireproofing whether sprayed or troweled no longer present on the steel members

WORLD TRADE CENTER
ELEVATOR SHAFTS ASBESTOS ASSESSMENT

FLOOR	SHAFT	FIREPROOFING INTACT	DELAMINATION	QUANTITY DELAMINATED	RECOMMENDATION
3	14B	NO	YES	2 S.F.	SEAL EDGES
4	14B	NO	YES	2 S.F.	SEAL EDGES
8	14B	NO	YES	1 S.F.	SEAL EDGES
9	14B	NO	YES	1 S.F.	SEAL EDGES
10	14B	NO	YES	1 S.F.	SEAL EDGES
11	14B	NO	YES	1 S.F.	SEAL EDGES
12	14B	NO	YES	1 S.F.	SEAL EDGES
13	14B	NO	YES	1 S.F.	SEAL EDGES
14	14B	NO	YES	1 S.F.	SEAL EDGES
15	14B	NO	YES	1 S.F.	SEAL EDGES
16	14B	NO	YES	1 S.F.	SEAL EDGES
17	14B	NO	YES	1 S.F.	SEAL EDGES
18	14B	NO	YES	1 S.F.	SEAL EDGES
23	14B	NO	YES	1 S.F.	SEAL EDGES
24	14B	NO	YES	1 S.F.	SEAL EDGES
25	14B	NO	YES	1 S.F.	SEAL EDGES
26	14B	NO	YES	1 S.F.	SEAL EDGES
27	14B	NO	YES	1 S.F.	SEAL EDGES
28	14B	NO	YES	1 S.F.	SEAL EDGES

SPRAYED-ON MATERIAL

FLOOR	SHAFT	FIREPROOFING INTACT	DELAMINATION	QUANTITY DELAMINATED	RECOMMENDATION
310	15B	NO	YES	4 S.F.	SEAL EDGES
3	15B	NO	YES	2 S.F.	SEAL EDGES
4	15B	NO	YES	4 S.F.	SEAL EDGES
22	15B	NO	YES	1 S.F.	SEAL EDGES
25	15B	NO	YES	8 S.F.	SEAL EDGES

SPRAYED-ON MATERIAL

Note Delamination is fireproofing whether sprayed or troweled no longer present on the steel members

THE PORT AUTHORITY OF NY & NJ

TWO WORLD TRADE CENTER, 37TH FLOOR
NEW YORK, NY 10048

(212) 435-7000
(201) 961-6500

October 18, 2000

R. W. Crandlemere & Associates
549 Columbian Street
Suite 305
Weymouth, MA 02190

RE: **ASBESTOS DUE DILIGENCE: INFORMATION REQUEST.**

Dear Mr. Crandlemere:

Please find attached the responses to your October 12, 2000 fax wherein you requested that the available asbestos information be broken down into seven areas. In addition, responses to your general information requests are also provided.

Request: **Total remaining and total removed ACM, broken down by material types and locations, within the designated areas as much as practical (e.g. by floor number or other description; such as within pipe chase or the elevator shafts).**

The attached breakdowns for 1 WTC, 2 WTC, 4 WTC, 5 WTC, MERs, Subgrade, and Concourse disclose the estimated amounts of asbestos-containing sprayed-on fireproofing and thermal system insulation material present. Drawings identifying these asbestos locations by sample number are on file in my office. Attachments disclosing the amounts of vinyl asbestos floor tiles present as of April, 2000 are also included. These estimates were provided by the Port Authority's Engineering Department, Asbestos Litigation Task Force, and the World Trade Department.

Asbestos-containing roofing material was removed from the MER set-backs in 1 and 2 World Trade Center, and the roofs of 4 and 5 World Trade Center. The roofs of 1 and 2 World Trade Center were not sampled.

Request: **The abatement costs for work performed and anticipated future abatement costs for each type of remaining known ACM.**

From 1986 to 1999, a total thirty one (31) contracts were bid, and a total of $58.2 million dollars was spent in abatement projects. The Engineering Department estimates the cost for vinyl asbestos floor tile removal to be between $5 - $6 per square foot, sprayed-on removal to be between $20 - $25 per square foot, and thermal system insulation to be $15 per linear foot (outer diameter dependant).

As of September, 2000, a total of 2,184,038 million square feet of sprayed-on fireproofing, and 3,500,000 million square feet of vinyl asbestos floor tile was removed. According to PA records, a total of seven million square feet of vinyl asbestos floor tiles were installed in the World Trade Center.

Request: **Materials determined not to be ACM (e.g. spline ceilings, hung ceilings, wallboard, wallboard joint compound, etc., as well as areas of sprayed-on fireproofing determined not to be ACM).**

Sampling of the building materials noted above did not disclose the presence of asbestos.

Request: **Any materials that are assumed to be ACM (such as fire doors) with an estimate, if possible, of the amounts of each material.**

Our presumption as to the types of asbestos-containing building materials within the World Trade Center did not include fire doors. Based upon sample data, asbestos containing building materials appear to be limited to sprayed-on fireproofing, thermal system insulation, and floor tiles and mastic.

Request: **Asbestos litigation status.**

Your information request has been forwarded to the Port Authority's Law Department. We will notify you accordingly.

The following information is in response to your fax dated Wednesday, October 18th.

Request: PCB-containing Hydraulic Fluid.

The hydraulic fluid (hydraulic oil # 32 AW) leaking from elevator FE-5, located on the B4 Level of 1 World Trade Center does not contain PCB. I have a copy of the Material Safety Data Sheet from the distributor; Consumers Oil, 515 South First Avenue, Mt. Vernon, N.Y.. Hydraulic elevator FE - 6 in 2 World Trade Center also uses hydraulic oil # 32 AW.

Relating to the trash compactors, please note that the hydraulic fluid is ordered through the Port Authority Stockroom from an approved list of chemical products established by the Inspection & Safety Division. The hydraulic fluid used for the trash compactors is either mineral or vegetable based. Both are non-PCB products.

Request: Additional Information Regarding Radio-Frequency Testing.

I do not have a copy of, nor do I have knowledge of the March ,1999 report prepared by Denny & Associates recommending additional RF exposure monitoring. All radio-frequency documents are available for your review in the Document Room.

Please contact me at (212) 435-8507 should you have any questions or require additional information.

Phil Taylor
World Trade Operations &
Maintenance Management

Cc: J. Connors, A. Reiss, L. Zucchi

1, 2, 4, and 5 WTC

SUBGRADES and TRUCKDOCK

Subgrades -

1 WTC:

B1 Level – Core, and N/E Quadrant	5,000 sqft / No TSI
B6 Level – Entire Level	40,000 sqft / No TSI
TOTAL:	45,000 sqft / No TSI

2, 4, and 5 WTC: No ACM

Truckdock -

Main Truckdock	50,000 sqft

APPENDIX B

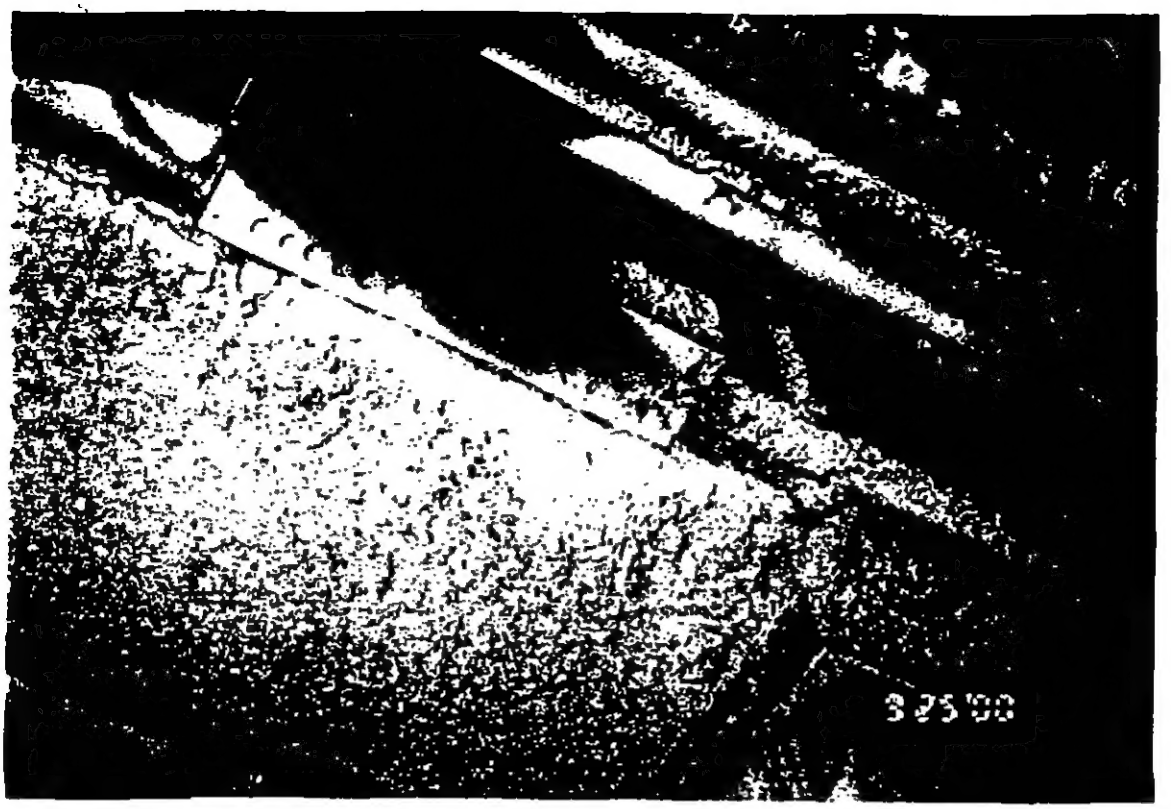

Photo #1: Spray-on fireproofing, loading dock area.

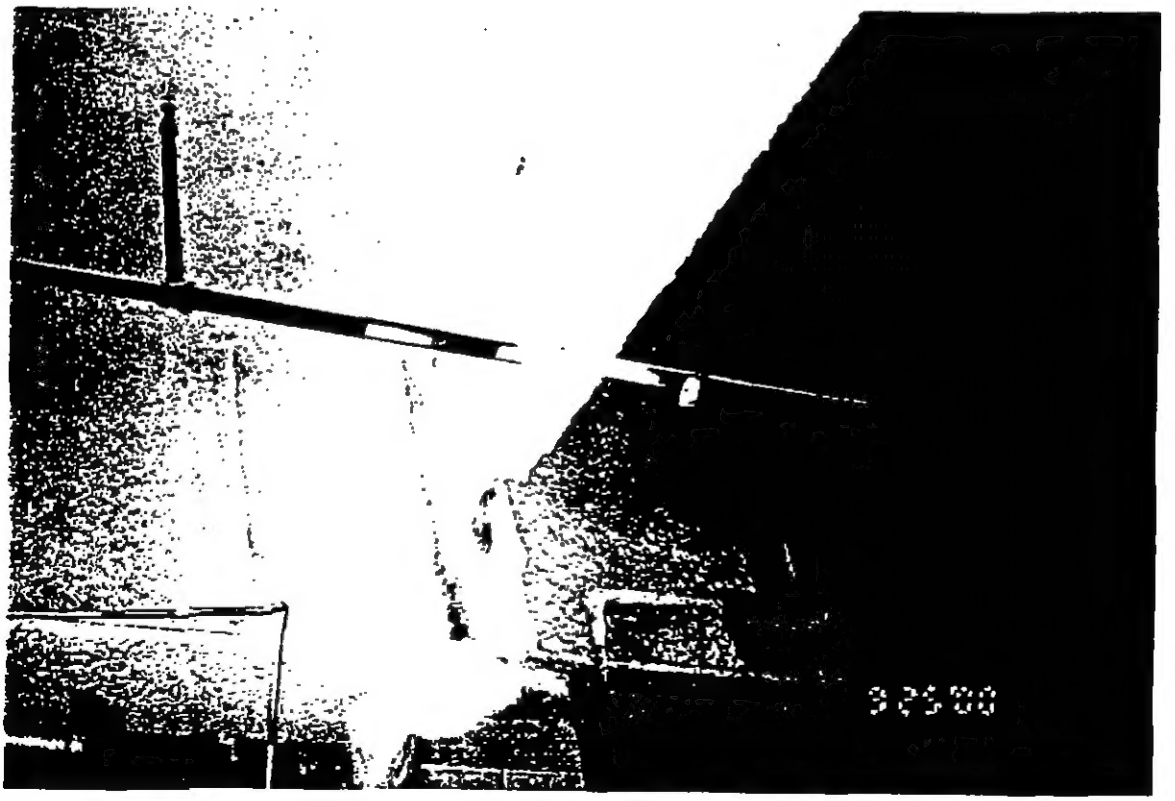

Photo #2 Spray-on fireproofing, loading dock area.

CCRL #125 The cement appeared "crunchy" in vial - when making mount
SAM - A course sound came from the beaker while the solution was stirring - 26.45% IR
Sugar Extraction: Tried filtering without wetting filter paper first - went well
Nitric Acid: lighter than CCRL # 126

CCRL # 126 Used No. 2 filter paper
SAM - used powder-to-powder method - 24.67% Insoluble Residue
Sugar Extraction: 30 second procedure: worked very slow and had Greenish color pipetted off excess liquid

CCRL # 127 Noticed clumps of matter -
SAM - 27.50% IR
Sugar Extraction: worked well with 30 second heating

CCRL # 128
SAM - 25.66%IR
Sulfur smell after grinding - suspect Slag
Sugar Extraction: filtering wen very slow, Clogged up and had to pipette off
Sugar extraction: Raw cement - worked relatively well,

Attemped X-ray microanalysis but had difficulty in getting good fit with standards